The American CINEMATOGRAPHER

VOL. 3, NO. 4 LOS ANGELES, CAL. JULY 1922 TWENTY FIVE CENTS A COPY

"Loyalty, Progress, Art"

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RELEASES

MAY 14th to JUNE 11th, 1922

Producer	Title	Photographed by
	Sherlock Holmes	**J. ROY HUNT**
Paramount	**Beyond The Rocks**	**ALFRED GILKS, Member of A. S. C.**
Fox	**The Yellow Stain**	**DON SHORT Member of A. S. C.**
Cosmopolitan	**The Beauty Shop**	**HAROLD WENSTROM**
Fox	**Shackles of Gold**	**TOM MOLLOY**
Pyramid	**His Wife's Husband**	**H. STRADLING**
R-C Pictures	**Queen O' The Turf**	**NOT CREDITED**
Wistaria Prod.	**Lady Godiva**	**NOT CREDITED**
Chas. Ray Prod.	**The Deuce of Spades**	**GEORGE RIZARD Member of A. S. C.**
Universal	**Step On It**	**CHARLES KAUFMAN**
Fox Film Corp.	**Silver Wings**	**ROBERT KURRLE Member of A. S. C. and JOSEPH RUTTENBERG**
Metro	**Missing Husbands**	**NOT CREDITED**
Paramount	**North of The Rio Grande**	**FAXON M. DEAN**
Asso. First Nat'l Pictures	**The Primitive Lover**	**Member of A. S. C.**
Universal	**Kissed**	**DAVID ABEL Member of A. S. C.**
Goldwyn	**Watch Your Step**	**BENNIE BAIL**
Aywon-State Rights	**They're Off**	**JOHN MESCALL**
Di Lorenzo, Inc.	**The Trail of Hate**	**NOT CREDITED**
Fox	**The Men of Zanzibar**	**CHARLES STUMAR Member of A. S. C.**
Goldwyn	**His Back Against The Wall**	**DAVID ABEL Member of A. S. C.**
R-C Pictures	**Gay and Devilish**	**MAX FABIAN**
Fox Film Corp.	**Nero**	**PLINY GOODFRIEND**
Asso. First Nat'l Pictures	**The Crossroads of New York**	**HARRY PLIMPTON**
Metro	**The Face Between**	**BOB WALTERS and HOMER SCOTT, A.S.C.'s**
Sol Lesser	**Trouble**	**ARTHUR MARTINELLI**
Vitagraph	**The Angel of Crooked Street**	**GLEN Mac WILLIAMS**
Asso. First Nat'l Pictures	**The Girl In The Taxi**	**STEVE SMITH, JR. Member of A. S. C.**
Fox	**Very Truly Yours**	**ROSS FISHER Member of A. S. C.**
American Releasing Corp.	**The Cradle Buster**	**JOHN ARNOLD Member of A. S. C.**
Leah Baird Prod.—Assoc. Exhibitors	**Don't Doubt Your Wife**	**FRED WALLER, JR.**
Cosmopolitan Prod.—Paramount.	**Find The Woman**	**CHARLES STUMAR Member of A. S. C.**
Metro	**They Like 'Em Rough**	**IRA H. MORGAN Member of A. S. C.**
Goldwyn	**Yellow Men and Gold**	**JOHN ARNOLD Member of A. S. C.**
Paramount	**The Woman Who Walked Alone**	**CLYDE De VINNA**
Universal	**Out of The Silent North**	**BERT GLENNON**
Benj. B. Hampton Prod.—Goldwyn.	**Golden Dreams**	**ARCH REEVES**
Renco Prod.—Hodkinson	**The Veiled Woman**	**WILLIAM EDMOND ROSS FISHER Member of A. S. C.**
Penrhyn Stanlaws Prod.—Paramount.	**Over The Border**	**PAUL PERRY Member of A. S. C.**
Playgoers-Assoc. Exhibitors	**Tracks**	**NOT CREDITED**
American Releasing Corp.	**False Fronts**	**NOT CREDITED**
Assoc. First Nat'l Pictures	**Domestic Relations**	**JOSEPH BROTHERTON**
Selznick-Select	**A Woman of No Importance**	**NOT CREDITED**

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The American Cinematographer

The Voice of the Motion Picture Cameramen of America; the men who make the pictures.

Board of Editors—J. A. DUBRAY, H. LYMAN BROENING, KARL BROWN, PHILIP H. WHITMAN
ALFRED B. HITCHINS, Ph. D., F.R.P.S., F. R. M. S., F. C. S., Associate Editor

Contents for July

An educational and instructive publication espousing progress and art in motion picture photography while fostering the industry.

We cordially invite news articles along instructive and constructive lines of motion picture photography from our members and others active in the motion picture industry. All articles must be signed by name of writer.

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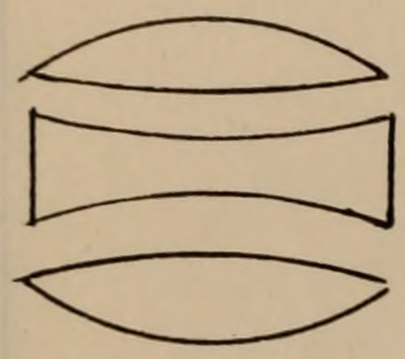
Modern Lenses

SECTION THREE

By Karl Brown, A. S. C.

NOTE—The American Cinematographer gratefully acknowledges the valuable assistance of Mr. M. C. Williamson, of the Wollensak Optical Company, for data and diagrams; and the data supplied by Mr. Henry F. Branstotter of the Hanovia Chemical and Mfg. Co.

The Anastigmat



The modern anastigmatic lens is a most striking example of the triumph of sheer intellect over seemingly physical impossibilities. Nothing in the history of science, not even the airplane, or the radio, is a greater monument to human invention than the anastigmat. It is really and truly a scientific miracle.

The achievement of the modern anastigmat is the result of over two-thirds of a century of hard work and concentration. During this time, the ideal of what a lens should be, changed with the necessities of contemporary conditions.

The first ideal was that of great speed, with which to overcome the difficulties of photography with the very slow emulsions of that day. Petzval, one of the most brilliant of all opticians, in his attempts to reach this ideal, produced and marketed the famous Petzval Portrait Lens, of the then tremendous aperture of F.3.2. in the year 1840. The Petzval lens was a collossal achievement, and one which gave photography a great forward step. The development of the Petzval formula by Dallmeyer and Zinke-Sommer gave photographers an improved lens with a greater aperture, F.2.3., and the day of extremely prolonged exposures was over. The Petzval Portrait Lens, in a modified form, is still a favorite. The Wollensak Vitax, F.3.8. is such a lens.

The faster emulsions were made. The wet plate, then the dry plate, contributed more and more to the practicability of photography, and as the emulsions improved, less attention was paid to speediness in lenses, and the long and discouraging struggle for perfect correction began, an effort which owes its success to the development of that modern marvel, optical glass.

The advent of optical glass gave an immense impetus to lens making. The lack of that very material had been the stumbling block. It is one thing to calculate a lens, and another thing to make one. With the limited glasses at their command many things were practically impossible, although theoretically feasible enough if they could but get the proper glass. The new glass was produced and developed to the point where it was possible to obtain almost any desired qualities, thus opening the way for a new era of lenses.

With the versatility of the new glasses at their command, the next step was the production of high speed, fully corrected anastigmatic lenses, an ideal which was quickly reached in a number of brilliant examples, first of which were the lenses of Carl Zeiss. This ideal of perfect definition reflects itself in all photography of that day, with the exception of a small group of misunderstood artists who were producing laughed-at soft images which are the despair of modern workers. An ideal portrait was one looking like a statue; one flattered the photographer by commenting on the perfection with which every hair was registered.

This ideal held force until it dawned upon the photographic world that art was not necessarily a matter of optically perfect definition; but that it might be possible to make a good picture without this cherished precision. The few workers of the advance guard found themselves held in a little less scorn than before, and once the idea of soft-image got really under way, the whole pictorial world began turning out a few soft image pictures, and a very great many soft focus ones. There's a vast difference! Now it is difficult to find a sharp portrait anywhere. Even mechanical devices are advertised with soft focus photographs. This last change of ideal brought about the development of more lenses than any of the others. It is difficult to produce a high speed lens, and still more difficult to produce a high speed, fully corrected lens, but any old lens which will not give a perfect image may be properly and safely classed as a soft focus lens. Probably the most satisfactory of our present soft focus lenses is the simple spectacle lens, wholly uncorrected.

This last ideal of what a perfect soft image lens should be has not yet crystallized to the point where makers can concentrate on a given objective. Too much variance of opinion makes this impossible. Soft image photography is still in the formative stage.

This change of ideal was most fortunate for the cinematographer. He needed, particularly at the beginning of the art, speed, and definition, and now, in the later and more artistic stage, the beauty of the soft image. The first two were waiting for him; the last he must help develop.

The modern motion picture anastigmat is, with the possible exception of the Process Apochromat, the most perfect photographic objective in the world. The shortness of its focal length in relation to the comparatively great distance of the object being photographed brings about a highly desirable optical condition. To photograph an object at a distance of ten feet with a two-inch lens is equivalent to photographing an object fifty feet away with a ten-inch lens, as far as the optics are concerned. Hence the great "depth," properly "depth of field,"' of the usual motion picture lens. This condition of work is responsible for the very fine performance of motion picture lenses, as compared to larger lenses of the same make.

The subject of depth of field is one very commonly misunderstood by a large number of photographers. The writer has heard innumerable assertions concerning the superiority of a certain make of lens in its great "depth" as compared with other lenses. Such arguments have no foundation in fact. Depth of field has nothing to do with the formula or type of lens; the determining factors are size of aperture and focal length. Two dissimilar anastigmatic lenses of the same aperture and focal length are equal in depth of field. The depth of field increases as the size of the stop is diminished, and becomes greater the more removed the object focused is from the lens. The exception to this rule is in soft lenses, which show a great increase in depth of field over an anastigmat of the same aperture and focal length, and this varies with the formula. Some soft lenses show an increase of several hundred per cent. greater acceptable depth of field over a similar anastigmat.

A lens "carries" farther back of the point focused on than in front. For instance, any two-inch lens

focused at 13 feet shows practical sharpness from 10 feet to 18 feet, and this proportion of front and back depth holds fairly true under all conditions.

Of the several lenses adapted to cinematography, only three are in general use, these being the Zeiss Tessar, by Carl Zeiss, E. Krauss, and Bausch and Lomb, the Goerz Kino Hypar, and the Cooke Cinematograph. In the early days of the motion picture, the Goerz Celor was used, but this lens is no longer in use, and its manufacture has been discontinued. The Celor does not compare with the more recent lenses, in anastigmatic qualities, but is occasionally used for close-up work, because of its soft working qualities. The Heliar, F.4.5., a really excellent lens, is out of favor on account of its comparative slowness, although at one time it was very popular. A little known, very new lens is the Wollensak Cinema Velostigmat, of which more will be said latter.

There is no "best" motion picture lens. Tastes vary, and a lens quality that is suitable to one type of work is not suitable to another. Image quality in lenses designed for the same purpose is found to vary, and that variance seems to be based on the number of glasses, cemented or not, the softer the image quality.

The Carl Zeiss Tessar is one of the oldest standard lenses on the market, and one of the best. The Tessar formula is of four glasses, two of which are cemented. Theoretically, the lens might be classed with the three glass systems, but in practice, it is less brilliant than these. This lack of high brilliancy is by no means a detriment; it simply means that a Tessar image shows a full line of graduation, a ready appreciation of low shadow detail, and full registration of overexposed highlight detail.

The fact that the Tessar has actually four glasses, and these comparatively thick ones, has a great deal to do with this image quality. A cemented pair of glasses, such as the first two of the Tessar, is stoutly claimed to be equal in all ways to a single glass—that the cemented surfaces cannot reflect light to be lost or shown as flare. This theory has been the subject of considerable controversy, some opticians claiming that cemented surface nearly, but not quite, fulfills this condition. The thickness of the glasses has this application: no glass is absolutely transparent, and thus, all glass transmitting light is made slightly luminous in itself by this light. This luminosity is extremely slight, and does absolutely no damage. Indeed, quite the reverse is true, because of a little discussed characteristic of a negative emulsion called inertia.

The inertia of an emulsion is the amount of light absorbed without photographic reaction, this amount being a small percentage of the exposure which varies with the speed of the emulsion. An emulsion already exposed this amount is in condition to record the slightest additional light. Astronomers often take advantage of this fact by exposing plates to a weak light long enough to overcome the inertia, in order to reduce exposures.

The amount of extraneous light transmitted by the Tessar, and the still softer five-glass Heliar, seems to be of great value in overcoming this inertia, and possibly accounts for the particularly pleasing richness of low-light graduation so characteristic of the Tessar negative. The extraneous light is below the inertia point so there is no suggestion of fog; the blacks are clean.

The Tessar is a deservedly popular lens. No greater tribute could be paid a lens than the willingness of cameramen to pay fancy prices for the Tessar when importations were impossible during the war.

The Goerz Kino Hypar is a three-glass system lens especially designed for motion picture work. It is particularly notable for its crispness of definition, and clean working qualities. The three thin glasses transmit less extraneous light than the Tessar, and its glasses are smaller. The result is a crisper image quality. Since there is no criticism without comparison, it may be well to compare these two absolutely standard lenses. The Tessar is soft and rich; the Hypar is brilliant and very clean. The Hypar will give a more brilliant image under poor light conditions than the Tessar, and has a greater latitude of exposure, due to this clean working.

The Hypar may be summed up as a clean, clear, optically fine lens. There are probably more Hypars in use than all other lenses put together, and there is a very good reason for this. It is easy to use, will handle difficult exterior locations, with poor light, and is not at all "tricky."

The Cooke Cinematograph is also of the simple, three-glass construction, with the resultant brilliancy. The additional aperture of F.3.1., is really valuable, as the lens is quite efficient at that speed. The one outstanding thing about the Cooke is its fine workmanship, optically and otherwise. It is absolutely sharp, and very clean working, and seems to be about as fine an optical instrument as one could desire. In comparing work, there is little to choose between a Cooke negative and a Hypar negative, both being of the same quality class. The Cooke does have, however, the undeniable advantage of greater speed, and it is a little better made, especially in the matter of diaphragms. One peculiar thing about the Cooke is that the diaphragm control turns just opposite to other lenses in fading out—a valuable thing to remember when working with one of them.

It must be remembered that the differences in image quality given here is not the result of observations of single individual lenses. That would be hardly fair. These differences, which by ordinary standards are very slight, still are great enough to be well worth considering. It would be a task to distinguish between the work of these three lenses when used under ideal conditions, and by men who know how to get the best out of them. It is in difficult places the lenses show their characterstics.

These three lenses practically dominate the field of general utility lenses, and they represent the best of their type. The war, however, has brought about new possibilities of lens constructions in America, due to the development of American made optical glass. This will be a big factor in future motion picture lenses. Lens makers are trying hard to improve their product, and are making every effort to supply every known want, all of which is very fine for the cameraman. One point of special interest is the effort to produce a really useful soft image lens for motion picture work. These lenses, as well as the special purpose lenses, will be material for future discussion in this article.

SPEED!

Harry Thompson, chief electrician for the Elmer Clifton Productions, claims he has to his credit one of the speediest little pieces of "hooking up" on record. The Charles W. Morgan, oldest whaling vessel afloat, was brought across the river from Fairhaven to New Bedford Saturday where she is being used for deck and cabin scenes in Mr. Clifton's "Down to the Sea in Ships." Mr. Thompson had two transformers brought up, ran leads to the masthead, connected plugging boxes to a switch in the forecastle, hooked up ten Wohl lamps and two 85-ampere spotlights, and had the entire forecastle ready to shoot in an hour and a half from the time the ship touched the pier. If there are any other electricians running around who think they can beat that, Mr. Thompson would like to hear from them.

Shoots "Snow Stuff" In Summer

A S. C. Member Tells Interesting Experience With Nell Shipman Company at Spokane, Wash.; Lives on Snow Shoes for Several Weeks

While most of the United States is sweltering in the heat of summer, one veteran cinematographer is having no trouble at all in keeping cool. He is Robert S. Newhard, A. S. C., who is cranking for the Nell Shipman Studios, with headquarters at Spokane, Wash. They are still making "snow stuff" up there, even if it is summer. The following letters, received recently from Newhard, tell an interesting story. They are printed with some stills showing that it has been, it is, or it will be a hard winter.

Spokane, Wash.

Dear Bunch:

I'm not lost—but the winter which has just made its rather reluctant departure almost caused my disappearance—under the snow.

I've been up in the wilds of the Northwest for over three months, now, with Miss Nell Shipman, who is shooting her greatest picture of the out-of-doors, "The Grub Stake."

At this writing we are nearing completion of the feature, but we have surely had some location experiences that are worth relating.

One thing that strikes me as especially interesting is the snow stuff which we have made. I read with considerable interest the article in the May number on "How They Get the Snow Stuff." Say, all that machinery pictured gave me quite a laugh. Up here nature has been turning the snow machine handle—and turning out snow stuff such as was never before worked into pictures.

For weeks we were located in the heart of the wilderness with mountain ranges rearing up on all sides of us, and the snow lying from four to six feet deep on the level. It was impossible to take two steps anywhere without snowshoes, and I became an expert on them.

But to keep the story of our experiences in digging cameras out of the snow, traveling up the sides of mountains with them, and such other trivial matters for another telling, I want to relate something about "How Nature Makes Snow Stuff."

In the first place, nature began making the "snow stuff" for us along last November, and kept piling it up until good sized trees were bent over with the loads of it, and it seemed that there wasn't a place in the whole world but that was white.

This gave us wonderful scenery, which fitted in exactly with the setting of the story we are making.

But we were also desirous of making many scenes in actual blizzards and snowstorms. We hadn't long to wait for this, either. There were days when storms raged and flakes of snow filled the air until it seemed they would suffocate us.

Starting out to the location before daybreak, we would set up and then wait for nature to turn the snow crank until the proper sort of storm was raging, when we would shoot.

"The beautiful snow looks good on the screen, but it's no joke to shoot snow stuff," to quote the opening of the May article. Well, I can say the same thing, even if our snow up here was made by old Dame Nature instead of the ingenious man-conceived machines used in the southland.

In some of these blizzards we nearly froze to death; in others we were nearly lost—but we got the stuff, and you will have to admit it was there when you see it.

We're still working in the wilderness—and I might add that I'm investing copious amounts of money in fishing tackle, for I can't for the life of me resist the tantalizing mountain trout streams and hidden lakes around which we are working most of the time.

We're headquartering at Spokane, where we have an excellent studio.

Well, I must cease this and get ready for a location trip up a mountain peak near town where we have to shoot some more of nature made snow stuff—even if this is the middle of June.

Best wishes to all of you, and the hope that I'll see you soon.

Sincerely,
ROBERT S. NEWHARD, A.S.C.
Nell Shipman Studio,
Spokane, Washington,
May 9th, 1922.

Here's his second letter:

Dear Bunch:

Snow stuff! Oh, boy, we've had it.

Lost in the wilds of the Northwest, where the snow was anywhere from four to six feet deep on the level, Miss Nell Shipman and her company spent several weeks

Starting out to the location before daybreak, we

in the heart of the wilderness in the Little Pond Oreille (pronounced Pon-de-ray) country, traveling by bobsleighs to the end of the roads and then by snowshoes and dog sleighs.

The results are that Miss Shipman's forthcoming picture, "The Grub Stake,' promises to have some real thrillers in the way of snow scenes.

The cameramen, J. B. Walker, and myself, got a wonderful kick out of it, too. For several weeks running we never moved outside our cabins, without snowshoes. We got to be experts in the art of manipulating them, and in setting cameras on mountainsides and on top of six feet of snow. Some different from hardwood floors.

There were times when the cameras got away from us and went almost out of sight into the soft snow, and then we had some job digging them out.

Our camp was a homesteader's place on the shores of a large mountain-locked lake, but the water was frozen over with three feet of ice, and on top of this several feet of snow, so that it was almost impossible to tell where the lake was. We lived in cabins which had been erected by the homesteader for the accomodation of fishermen in the summer, and were first class. His wife furnished the meals and I want to say we learned what eating real country grub really is.

We were usually up at break of day, or before, and ready to move onto location by 6:30 o'clock in the morning. First all the equipment and the company was loaded into big horse-drawn bobsleds, which carried us for several miles over mountain roads, where the horses walked on the snow crust of the road, three or four feet above the ground.

Coming to the place where we were ready to leave the road, all the equipment would be loaded into dog sleds pulled by long teams of malemutes. We would then go to the base of the mountain on which we were to work, over the top of the unbroken snow.

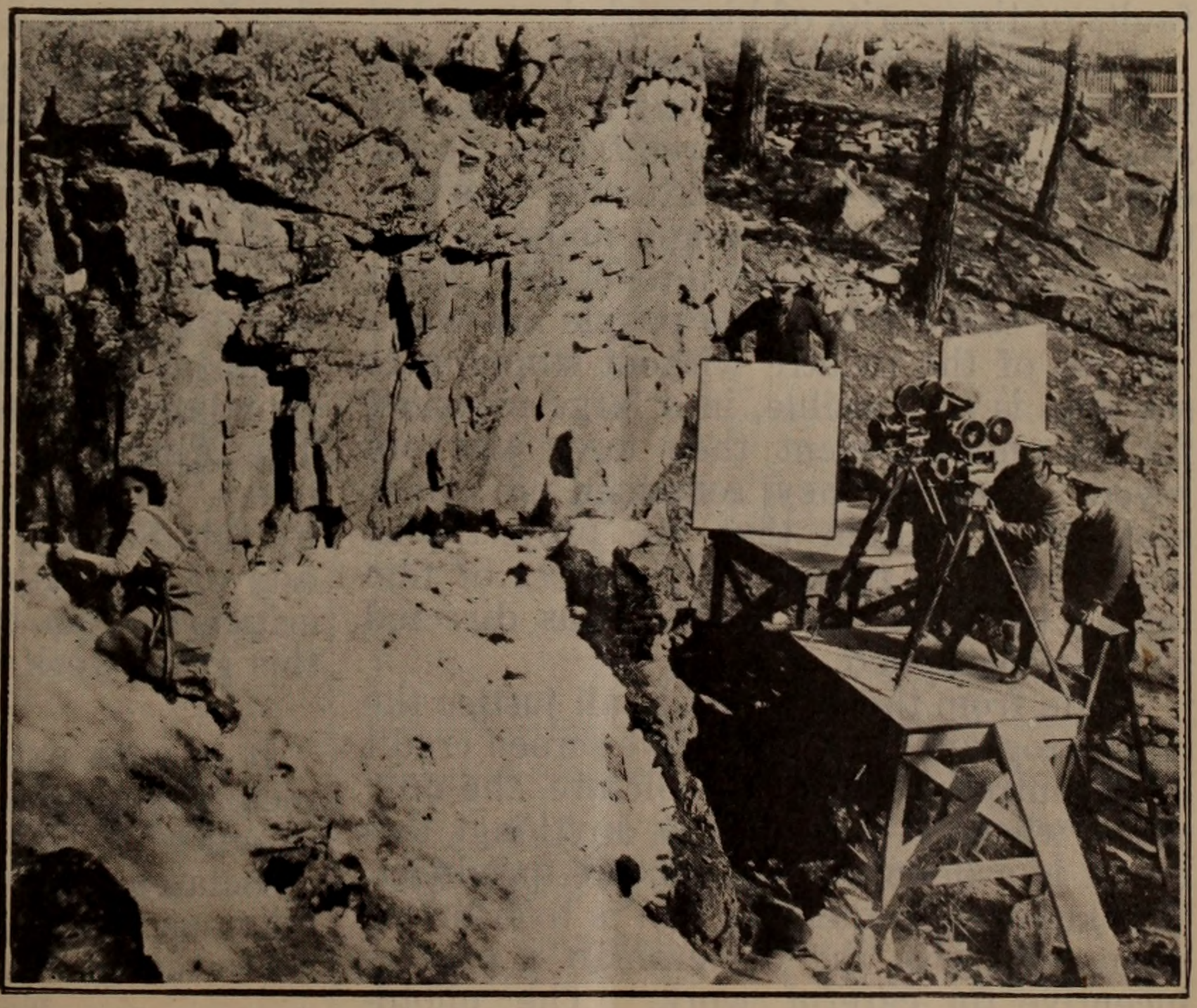
Going up the mountain was a different story. The dog teams could not pull the loads up the steep and rough grades, so that we, including cameramen, staff and members of the cast, loaded ourselves down with everything we could carry, and mushed up to the top on our snow shoes. Mt. Baldy is an infant compared to what we ran up against.

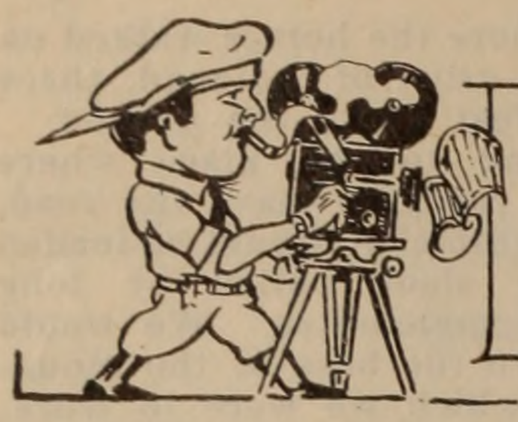
Once in a while there would be a call for help, and some member of the company would vanish from sight under the snow. Then there was the excitement of digging him out.

After we were on location, the first thing was to find something solid on which to set the cameras; and sometimes this was a hard task, so we got to carrying boards for the tripod points as we could not put snowshoes on them. And And then sometimes after we were all set a storm would come up and last the rest of the day, and the same thing had to be done all over.

Patience is a virtue of the cameraman, though, and we came out of the wilderness with some real snow pictures—blizzards, snow storms on mountain tops, sunset over the mountain ranges—everything that the most gorgeous winter scenery could offer.

(Continued on page 26)





The American Cinematographer

The astute philosopher who declared that a man who could write a better poem or build a better mouse trap could hang out his shingle in a jungle and have the world trample out all the underbrush in reaching his door, had, substantially, the right idea. But before such a higera from the mass of poets or mouse-trap builders could start, the world would have to know in just what jungle this retiring expert had located.

It is the same with cinematographers. The man who can accomplish better things with a motion picture camera always will be in demand—PROVIDED, his name goes out with his work and those who want cinematographers know, upon seeing a film, who is responsible for its photographic excellence.

Screen credit is the cinematographer's due, just as it is the star's, the director's, or the producer's. The cameraman deserves proper recognition, for it is only when he receives this that he can be judged by the faults or the merits of his work.

Certain producing organizations have instituted a system of placing the director's and the photographer's credit lines at the end instead of at the introduction of a picture, which means they might about as well leave the credit lines off altogether. After the final scene is over the people are walking out of the theatre without stopping to see who is responsible, in a large measure, for the entertainment they have just enjoyed. Even if they remained in their seats it is seldom that the projectionist would run the remaining few feet of film telling by whom the picture was directed and photographed.

Aside from the fact that in all justice the cinematographers should have screen credit at the introduction of the picture, the only place where it amounts to anything, this credit is a definite asset to the producer. The knowledge that the film is to bear his name will give the cameraman a greater incentive for careful work. The photography will always be better if the man at the crank knows that his is the credit for good cinematography and his the blame for poor.

If this matter of screen credit is taken with producers in the proper way they doubtlessly will see the justice of our contention. With few exceptions, the heads of producing organizations are anxious to play fair with the men working for their success. This should only be a question of getting together.

With this issue The American Cinematographer enters upon a bigger and broader scope of service to the art of motion picture photography. The need for a technical magazine of national influence, covering the activities of the entire film industry, has been so clearly expressed The Society of Cinematographers has decided to respond to this need.

While this magazine has already gained recognition throughout the industry as the only publication of its kind, the board of directors has prepared a program of expansion that will make The American Cinematographer of even more general appeal and of greater national influence.

Representatives have been established in principal cities of the East and are now working to build up the magazine in an editorial and a business way upon the solid foundation erected in the past few years by The American Society of Cinematographers. Although the magazine is published by this Society, it is devoted to the interests of the entire film industry. Aid and criticism from those in other branches of this great work will be welcomed.

It is with extreme regret that the directors announce the loss of Silas E. Snyder, as editor of this publication, as he is to be associated with the Rockett-Naylor Productions, Inc., an organization for which he formerly worked. While the Society is

(Continued on page 26)

Film Industry in Russia Primitive

Picture Earns Six Million Marks a Year in Poland—Only $2,000 in American Money

By John Dored

(Editor's Note—This is the first of a series of articles written for the American Cinematographer by John Dored, who gives an interesting insight to film conditions in the Baltic States. Mr. Dored, who is located in Riga, Latwija, Russia, has been an eye witness to the ever-changing conditions of the past few years there and is well able to give first hand information along these lines.)

The film business in the Baltic States is primitive indeed. The conditions under which pictures are exploited are of particular interest to Americans in that they show how far the industry has advanced there in comparison with these war-torn countries.

The Baltic States are suffering from recurring economic crises. These individual countries, off-shoots of the Russian Revolution, are laboring along with experimental governments. Various forms of legislation are being tried one after another, and the result is an extremely chaotic state for all forms of business.

The value of money issued by these states, is very low in exchange for the American dollar, English pound and French franc. For this reason the Germans are doing most of the business in these countries. The German mark here is also far below par, but German industries, untouched by the war, are in full swing. German pictures dominate the field in the Baltic States, as few American, French or Italian productions are shown here.

The film exchanges for Esthonia, Latwija and Lithuania, are all located in Riga, Latwija, from which place the pictures are distributed to these three countries. And for this extensive territory only one print of a production is purchased and exploited.

The rental price for a first run program consisting of a drama, a comedy and an educational film, is:

Latwija—about 25,000 Latwijan roubles, at 250 to a dollar	$100
Esthonia—about 50,000 Esthonian roubles, at 357 to a dollar	140
Lithuania—about 20,000 German marks, at 300 to a dollar	65

After such a program is run for a year, it gives from these three countries together a gross income of from $600 to $800.

There are in Latwija about thirty theatres, in Esthonia about forty, and in Lithuania about twenty-five. The seating capacity of these theatres ranges from one hundred and fifty to six hundred.

The population of these three Baltic States consists chiefly of five nationalities: Latwijans, Esthonians, Lithuanians, Russians and Jews, each speaking a different tongue. This necessitates the exploitation of each picture in five different languages. The result is that in order to save time in recutting the titles and also to save raw stock, the pictures are titled in five languages, much to the annoyance of the audience which is compelled to look at the same title in five tongues, four of which are absolutely unintelligible to them.

Most of the Polish exchanges are located in Warsaw. And as a rule only two or three copies of a production are bought and exploited.

The rental price for a one week program is, for a first run, from 400,000 to 500,000 Polish marks and for a second run, from 200,000 to 600,000 Polish marks. The gross income for a year's exploitation of such a program is from 3,000,000 to 6,000,000 Polish marks, or from $1,000 to $2,000.

There are in Poland about three hundred theatres, all of which are poorly equipped.

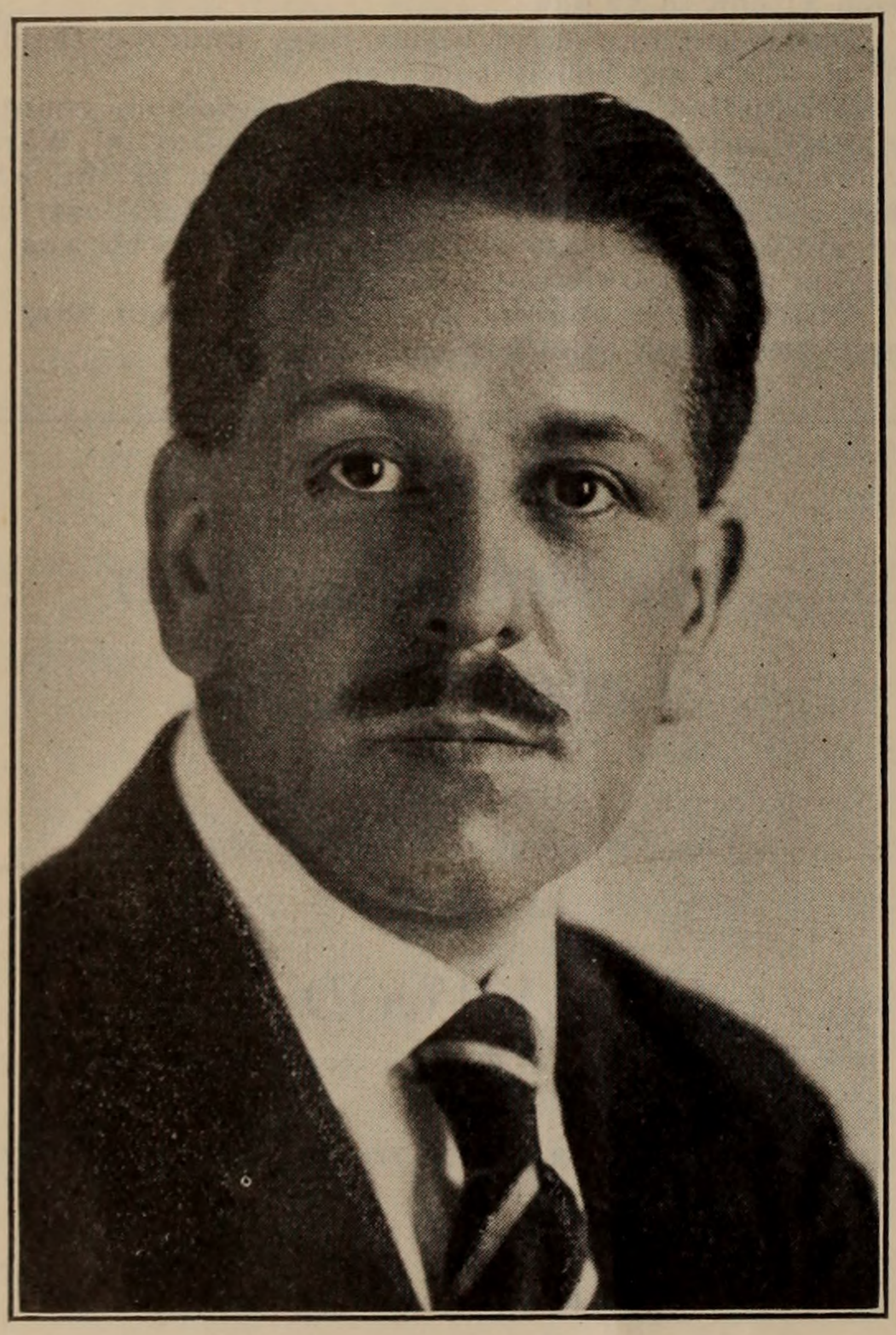
Production of pictures in all of these four countries is practically nil. There are two studios in Warsaw where occasional pictures are made, but on the whole they are dismal failures due chiefly to insufficient funds for building first class studios and laboratories and employing a good technical personnel.

There are a number of laboratories, but they are used mainly for title making.

Testing and Maintaining Photographic Quality of Cinematographic Emulsions

By ALFRED B. HITCHINS, Ph.D., F. R. P. S., F. R. M. S., F. C. S.
Member of the Society of Motion Picture Engineers.

THE photographic emulsion is the basis of the moving picture. Two emulsions of course are necessary—the negative and the positive. The negative emulsion must be exceedingly fast, that is to say it must be very sensitive to light; it must be orthochromatic or color-sensitized and be capable of rendering faithfully all the tones of the scene photographed without sacrificing any detail in high-lights or shadow, consequently it must have considerable latitude and be an emulsion of comparatively low contrast. The positive emulsion is slow and must be capable of reproducing all that is in the negative, and at the same time must have the possibility of developing to full rich blacks in order to have proper projection value, therefore it is an emulsion of considerably higher contrast than the negative.



ALFRED B. HITCHINS

A photographic emulsion is made by precipitating silver bromide, silver chloride or silver iodide in a solution of gelatine. The gelatine acts as an emulsifying medium causing the precipitate to be exceedingly fine and uniform so that the emulsion, when mixed, is milklike in appearance. The proportion of silver halides is varied according to the character and quality of the emulsion desired. The exceedingly rapid negative emulsions are usually bromo-iodide; that is they are silver bromide emulsions with a small proportion of silver iodide. The positive emulsion may be chloro-bromide or in some cases bromo-iodide.

In making emulsions on a manufacturing scale the halide salts of sodium or potassium with the necessary emulsifying gelatine are placed in jacketed kettles, then the silver nitrate is poured into this salt gelatine solution and the silver halide is formed. The temperature at which emulsification takes place and the amount of gelatine present at the time of emulsification are determining factors in quality and character of emulsion. The emulsion is digested for a given time at certain temperatures which have been found to produce the necessary quality. In order to make a uniform product day by day these temperatures must be kept constant and all the mixing, digesting and blending kettles are fitted with recording thermometers. At the end of digestion the final amounts of gelatine are added, the mass is cooled down and then placed in refrigerating rooms and left until it has set to a stiff jelly. This jelly is then put through a machine very much like a big meat chopper, the whole machine being made of silver or pure nickel. The emulsion is cut up into fine worm-like shreds and washed in repeated changes of water in order to free it from the products of chemical reaction and

the excess halide salts. When washing is complete the shreds are drained and melted up ready for coating or spreading upon the celluloid base. Just previous to coating the emulsion is passed through a vacuum filter to remove dirt and other foreign substances, for the emulsion for moving picture work must be free from dust and dirt.

The machines for coating are highly specialized units, each machine being set in a long alley into which only washed and conditioned air can enter; there are means of varying the temperature and controlling the humidity of the air throughout the length of the alley. A coating machine head is shown diagramatically in

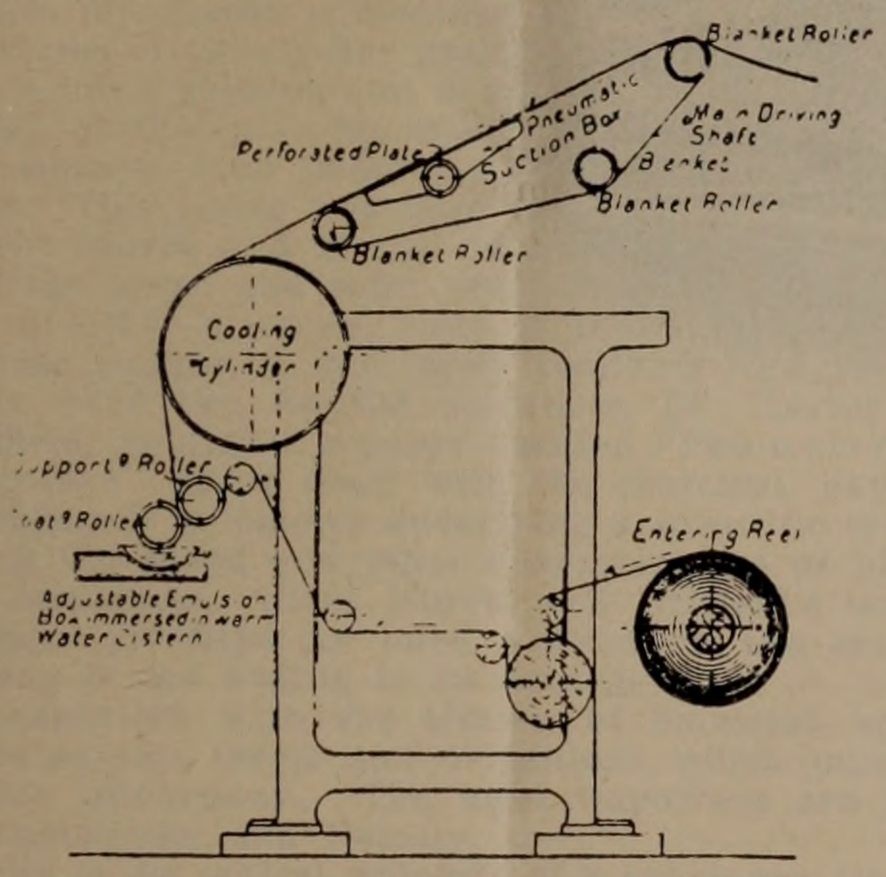


Fig. 1—Diagrammatic Sketch of Coating Machine Head.

Fig. 1, the passage of the stock through the machine being plainly shown. The emulsion is held in a water-jacketed pan, and means are provided for maintaining a constant level and is transferred to the celluloid either by dipping or beading. In dipping the celluloid comes around a roll, which just touches the surface of the emulsion in the pan. It is transferred by a second beading roll by capillary attraction. After the celluloid has received the emulsion the stock rises over a chill roll and is carried by a suction apron to the first lifting stick, then carried on down the alley in festoons. During its passage down the alley the necessary drying and curing takes place and the stock winds up at the far end of the alley ready for transference to the slitting machines which cut it into motion picture width.

It will be readily understood that a large plant devoted to the production of moving picture film in millions of feet per week must have efficient methods of control in order to produce day by day emulsions of the correct character and quality. Knowing the qualities desirable in negative and positive emulsions, it is obvious that very strict tests must be made of the photographic performance of these emulsions as regards speed, rate of development, contrast and other emulsion characteristics. This work has become a little science all to itself and is known as sensitometry.

Shortly after the introduction of the gelatine dry plate it was customary to express the speed of an emulsion as X times, meaning that it was X times the speed of a wet collodion plate. Such expressions naturally had very little meaning, as they were based on a variable factor. Early in the days of dry plate photography a well known photographic scientist, Leon Warneke, introduced a sensitometer having a series of numbered squares with increasing quantities of opaque pigment. The plate to be tested was placed in contact with these numbered squares and an exposure made to light emanating from a tablet of luminous paint which had just previously been excited by exposure to burning magnesium ribbon. Upon developing and fixing the test strip the last visible number was taken as expressing the speed of the plate.

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TESTING AND MAINTAINING PHOTOGRAPHIC QUALITY OF CINEMATOGRAPHIC EMULSIONS

(Continued from page 11)

The principal objections to this method were that no two numbered plates agreed in density, and the light emitted by the luminous surface varied considerably between its excitation and the exposure of the plate. Also the pigmented squares showed selective spectral absorption. We still see instances of plates marked upon the old Warneke system. For instance, Seed plate "23" and "27." It is here implied that for the same standard exposure these two Seed emulsions would show as the last visible squares Nos. 23 or 27 respectively. Chapman-Jones introduced a modified Warneke sensitometer with a series of twenty-five graduated densities, a series of four colored squares and a strip of neutral grey, all five being of the same luminosity, and a series of four colored squares each passing a definite portion of the spectrum. This tester was used with a standard candle as a light source and is still in use for rough estimations of the speed and color sensitiveness of plates. A number of other methods, more or less similar in principle, were suggested, but none really proved practicable. In 1890 two English scientists, Dr. Hurter and Mr. Driffield, published a paper entitled "Photo-chemical Investigations" which dealt with the chemical, physical and mathematic principles underlying a scientific system of testing the speed and other characteristics of photographic emulsions. Since Hurter and Driffield's time a great many investigators have worked on the system, elaborating it and adding to its accuracy.

In connection with the testing of emulsion speed, there are several terms and definitions which must be thoroughly understood. The most important are Opacity, Transparency and Density.

Opacity is the optical property of a substance (in our case silver) to impede the passage through it of light. In other words opacity is the suppression of light or its absorption by the silver image.

Transparency is the inverse of this and is measured by that fraction of the original light which the silver image transmits.

Density is frequently confused with opacity. By Density is meant the number of particles of a substance spread over a given area. In our case it is the relative quantity of silver deposited per unit area and its symbol is the letter "D."

The relations existing between opacity, transparency and density, and also the terminology generally used in practical sensitometry are shown in Fig. 2. A consideration of these definitions enables us to trace the connection between the densities of a theoretically perfect negative and the light intensities which formed them.

$$O = \frac{Intensity\ Incident\ Light}{Intensity\ Transmitted\ Light} = \frac{I}{I}$$

$$T = \frac{Intensity\ Transmitted}{Intensity\ Incident} = \frac{I_t}{I}$$

$$D = -\log_{10} T = \log_{10} O$$

$$I \div O = I_t \text{ or } I \div I_t = O$$

Putting $\frac{I}{I_t}$ into logs gives

$$\log I - \log I_t = \log O = D = Density$$

For instance when a plate transmits half the incident light

$$I \div I_t = Opacity$$

$$100 \div 50 = 2$$

$$\text{Log } I - I_t \log = \log O = Density$$

$$\log 100 = 2.000$$

$$\log 50 = 1.699$$

$$0.301 = D = Density$$

I		I_t	T	O	D
100		100	1	1	0
100		10	.1	10	1
100		1	.01	100	2
100		.1	.001	1000	3

$$\log I - D = \log I_t$$

$$\log I_t + D = \log I$$

Fig. 2—Relations between Opacity, Transparency and Density.

Density is a logarithm of the opacity and since in a theoretically perfect negative opacities are directly

proportional to the intensities of the light which produced them, it follows that each density must be proportional to the logarithm of the light intensity which produced it, or more correctly density is a linear function of the logarithm of the intensity of light and the time of exposure. So that in a theoretically perfect negative the amounts of silver deposited in the various parts are proportional to the logarithms of the intensities of light proceeding from the corresponding parts of the original object.

The practice of a system of emulsion speed measuring calls for a good deal of special equipment, the more important instruments are as follows:

1. Some form of standard light for making the exposures.
2. An exposing machine used in connection with the standard light for impressing the tests strips with a series of known exposures.
3. A thermostat for maintaining the developing solutions at constant temperature.
4. A photometer for reading the densities of the strips made in the exposing machine.

Standard Lights—Hurter and Driffield in their original investigation used the English Standard Candle. The principle objection to this light is its spectral composition. Candle light is decidedly orange-red. For non-color sensitive emulsions this may be used, but with yellow or red sensitive emulsions the speed readings would be absolutely wrong. The readings would be five or six times the true speed. The most satisfactory light source is acetylene. A special burner giving a long cylindrical flame is used. The burner is surrounded by a circular metal chimney having a small rectangular opening fitted with a cone which extends to within three milimeters of the surface of the flame. Thus only a very small portion of the flame is used, and by keeping the gas pressure and the height of the flame constant the intensity of the light does not vary 1%. The acetylene light is calibrated to a standard candle. In front of the rectangular opening in the chimney a special blue violet filter is placed that reduces the spectral composition of the acetylene to practically the same as daylight.

Exposing Instruments — Numerous intruments for impressing a graduated series of exposures have been proposed and they may be divided into two classes, depending on whether a time or an intensity scale is used. Intensity scales usually consist of a sheet of glass covered with squares of pigmented gelatine, transmitting known amounts of light. Thus, in the Warneke sensitometer previously described, each square transmits one-third less light than the preceding. At the present time intensity scales are very seldom used in practical sensitometry. A time scale may be impressed by intermittent or continuous exposure. For many reasons a continuous or non-intermittent exposure is most to be desired and is always used in the testing of slow emulsions like positive. A time scale impressed by intermittent exposure is easily obtained with a sector wheel having a series of angular openings of the following values:

180 - 90 - 45 - 22.5 - 11.25 - 5.625 - 2.812 - 1.406 and .703 degrees. Each angular opening passes twice as much light as the preceding one and gives double the exposure. The sector wheel is revolved during the exposure in front of and as near as possible to the sensitive film. For negative emulsions it is usual to expose 40 c.m.s. and as the largest angle on the wheel is 180° we must give an exposure of 80c.m.s. to obtain an effective 40 c.m.s. The form of the wheel is shown in Fig. 3. When the exposures are made with a wheel of this type there is a constant error known as the intermittency error. If an emulsion is given, for instance, a continuous exposure of one second, and upon development yields a certain density, another strip of the same emulsion which has been given a series of intermittent flashes which altogether total one second will,

Fig. 3—Sector Wheel of Sensitometer

upon development, give very much less density than the one which received the continuous exposure. The continuous exposure brought about a definite change in the silver bromide emulsion; the intermittent exposure coming in flashes, each flash made very little effect upon the emulsion and there is a tendency for the slightly acted upon silver halide to return to the normal or stable condition, hence the intermittency error is most noticable through the small angles of the wheel and is least objectionable when measuring very fast emulsions. The error, however, becomes very great on slow emulsions and would be altogether too high for reliable readings of positive film.

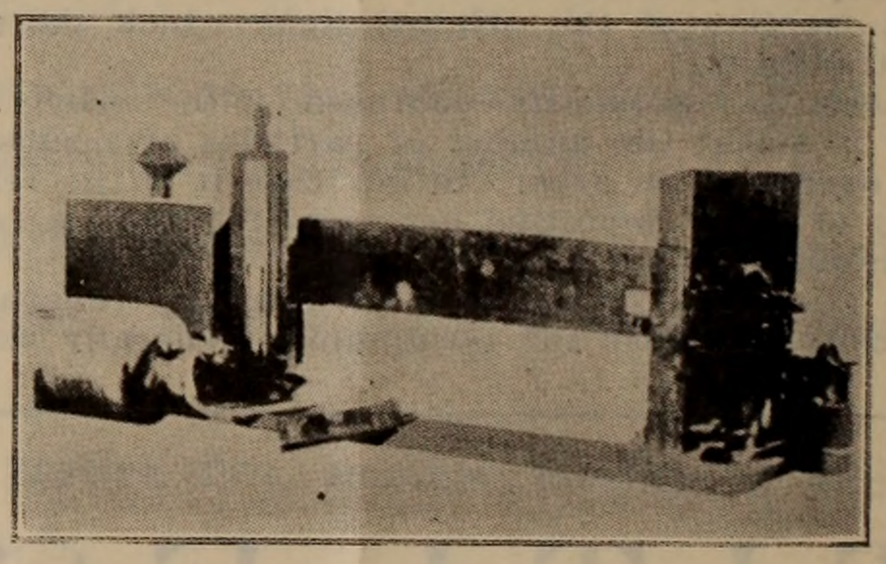

Fig. 4—Sensitometer.

The sector wheel for testing negative emulsions is enclosed in a box 12x12x2 inches. At the back of the box are fitted grooves to carry the film-holder. The

(Continued on page 21)

Motion Pictures of the Future and the Equipment Probably Required

An Address Delivered by S. L. Rothafel Before The Recent Exhibitors' Convention.

MR. President and Gentlemen: I am no going to read from a paper, because I like to do things extemporaneously. My subject, I believe, has been slightly misquoted. It is "The Motion Picture Theatre," instead of "The Motion Picture." I think I am better qualified to speak about the theatre than I am about the picture.

Before going into the general talk, I think it would be in order to tell you that about ten years ago, after I really became interested in the work which has culminated in the largest theatre in the world, I had a distinct vision, and I believe it has been a matter of record that the speaker prophesied the Capital Theatre ten years before its inception. I merely make this statement to you, to give you some idea that it was not altogether a dream. It became a reality.

What I am here for this morning is to make another prophecy, a prophecy more remarkable even than that was ten years ago. I have seen the motion picture theatre grow, from my start in a little room back of the bar-room in a small mining town of 7,000, where I had to borrow twenty-five undertaker's chairs, and I believe that several people in the room saw the start, and I have seen it grow slowly but surely to the magnificent palace in New York and many other splendid theatres through the country. To tell you again the old bromide that it is in its infancy would be superfluous. I tell you, gentlemen, the motion picture is going to grow, and with it the theatre will grow to a point none of us can now foresee. I prophesy an absolutely new era in the construction of the theatre. I prophesy that the motion picture theatre will parallel, in both its artistic endeavor and in its magnitude, the entertainment value and educational value of grand opera or any other artistic entertainment the world has ever known. I prophecy that the Government will endow a big motion picture theatre, as well as different states and municipalities. I prophesy that the motion picture theatre will be the great force for education, both in the elementary education of the school child as well as the recreation and education of the grown-up. I prophesy that the motion picture theatre is going to make this nation the most cultured nation in the world. I prophesy that the motion picture theatre is going to create and develop a musical taste that will be marvelous. It is going to create many new and wonderful composers; it is going to develop a new form of entertainment.

All these developments naturally will need new and different equipment. We will begin with the theatre. The motion picture theatre of today, as it is built, is entirely inadequate. It is merely a development of the old fashioned theatre with its boxes, its balconies, its lower floor and its stage. The new motion picture theatre will be built along high scientific lines, in my opinion, will be built more like the shape of an egg, with a huge stage, without any over hanging balconies, and as much as possible without an amphi-theatre effect, on one floor. I believe that the theatre will be of tremendous size, probably over 5,000 or more seats. It will not necessarily be located in the advantageous positions that have heretofore been the rule, but will be located in spots where the real estate value will not be quite so high, and where greater development in space and more attention to its construction can be carried out.

One of the greatest and most important adjuncts to the motion picture theatre, I think, which applies to the motion picture presentation, is the lighting. Toward this end, we are going to make perhaps our greatest strides in the next five years. I prophesy to you that the motion picture theatre of tomorrow will be lighted and controlled in a different manner entirely from the motion picture theatre of today. I prophesy that the lighting of the future motion picture theatre will be almost entirely by the projected ray upon a highly sensitized surface in different parts of the theatre. Color will play a most important part, and will be under the control of one individual operator, who will have a central station somewhere in the auditorium, preferably in the orchestra. This operator will be a highly developed and trained individual, who will know dramatic psychology, will know music, and that man will play upon a keyboard very similar to a piano, in which will be a development of the four primary colors, red, blue, yellow and green. These colors will be so divided on this keyboard that every note that is struck in the presentation by the orchestra, or any other effect desired, will be created by a single note along the octave of the piano, color piano, we will call it, and the octaves represented by different shades of each respective color, or such mixtures of color as may be necessary to obtain the effect, like, for instance, the very last note on the piano may be a very dark, deep blue, almost black, and running up to lighter shades of blue, until you reach a light steel blue. There have been developments along this line, and very remarkable developments.

You will readily see what an important part this will have in the development of the motion picture theatre. I might digress for just a moment: Audience psychology of today is a remarkable study. We have had a great opportunity to study it from every angle. I say this to you, that grand opera will never be popular, that is, universally popular among the masses of this country, because they are living too rapidly, they think too rapidly, they are restless, nervous. They want everything quickly, and it is a peculiar American habit, a sort of tabloid habit. They want everything quickly, and they want it in good taste, and they have got to get a thrill out of everything, and the color, plus the new theatre, plus the new ideas in presentation, which will be a huge magnificent orchestra, aided and abetted by wonderful organs and other equipment, and a wonderful projection, all will help in satisfying this desire.

In this, color therefore, will play a most wonderful part. We have even now in New York taken the ordinary switchboard, such as you know it, and we try to play with color as far as our capacity will permit. We are handicapped now by simply a primary system and the ordinary switches to make them, but by a careful development and careful training we have been able to get some very remarkable effects. We have used that in conjunction with projection. We have tried successfully projection on scrim, with a tabloid background. That was successfully tried during Armistice week, in connection with one of Mr. Kelly's pictures, "Where Poppies Bloom." It was a new thought, a new idea, and was received with a great deal of favor. We were further encouraged to try a new thing in scrim work, with the aid of projection, that puzzled many people, in another presentation that we gave, and it was all done by means of color. We create mood by color. We raise this dramatic climax by color, as we so often do in the theatre at home. For instance, we try to depict in color the dramatic effect of the overture to Tannhauser. We paint pictures, in other words, we paint our scenery with color, and then as the strains of that overture rise and come to a climax, the lights gradually rise with it, until the last chords are struck, and the brilliancy of the entire ensemble is so heightened that we have seen audiences fairly rise out of their seats at the combination of light, music, and the picture.

Now we come to the projection. There has not been as much advance in the projection as I should like to see, in the past five years. There has been some advancement, and we believe that we have done our share towards bringing it to the industry. We are now using what is known as the high intensity lamp. We were compelled to use it because of the tremendous physical

disadvantage of the long throw, and the tremendously obscured atmosphere. We tried everything until we developed or came upon the high intensity lamp. It was brought into the theatre and then developed by Mr. Sperry, until it is today, I believe, the most highly developed projecting art in the industry. We found that we could not use the art exactly as it was, so we had to get a form of filter which, after much experiment and trial, we have conquered. We then came upon a new shutter that was developed by Mr. Runcie, which did away with the opaque plate entirely, and once more we use color. But at no time during the traveling of the picture before the aperture does the light ever leave the screen. The result is very satisfactory, and is a decided step forward.

I had the great pleasure of watching a machine a few weeks ago that had a new idea in film movement. I really believe it is a decided step forward. But I really think that the projection picture of tomorrow will be entirely different from that of today. I really think it will be so controlled by automatic devices that it will require more highly trained men, men much more intelligent, than the operators of today—I will not say more intelligent, but more highly trained. I believe the manipulation of these machines will be entirely automatic, and will be so developed that it will be synchronized by either sound waves, or original photography, so that it will develop and change its own speed according to the respective action. I think it will be so highly sensitized that the slightest action will be developed and projected automatically.

Now, when this is done, we will begin to get the motion picture of the morrow where we will present motion pictures in such a way that they will be comparable to any form of entertainment or art before the world. The motion picture is not an art, and I doubt very much, gentlemen, if it ever can be, but the motion picture development, wedded to light, color and music, will be a new art, and I hope that I may live to see its culmination. We are working very hard, gradually, slowly. We have seen many wonderful things; we are dreaming of very wonderful things. We have every reason to tell you what we have told you this morning, and believe that everything we have said will be practically demonstrated within the course of the next ten years. We believe that the motion pictures are going to get, not one dollar, which we are now getting, but you will see seats as high as five dollars, to see a motion picture presentation. You will see the prejudices against the motion picture entirely eliminated. Censorship will be eliminated. The real backbone of the motion picture is going to be that step forward that I have spoken to you about. There will be many auxiliary branches, the development of the commercial branch, the development of the educational branch, the development, as I saw in an article yesterday morning, of the motion picture by radio. That is not at all impossible, and I firmly believe it is coming. Then there will be the development of the motion picture in medical science, the development of the motion picture in the science of teaching almost any study, and I want to tell you that whatever we have done in the past to bring the picture to its present state has only been a stepping stone and the foundation to something finer and bigger in the future. I thank you.

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Gives Will Hays Snapshot

MR. FRANK B. DAVISON, exposition expert, has returned from a swing around the circle which included Florida, Washington, New York, Cincinnati and other points. Here is how he tells about it to THE CINEMATOGRAPHER:

"Yes, I have just returned from a pretty thorough trip through the Eastern States and I find matters concerning business, brightening considerably, and particularly as regards the Motion Picture Industry. My greatest good fortune while away, was the opportunity and pleasure which was mine, of meeting and talking with Mr. Will H. Hays, and a chance to defend Hollywood before the Merchants and Manufacturers' Association of Cincinnati. I had expressed a desire to meet Mr. Hays at a dinner given before I left Los Angeles, but was advised by some of my friends that it couldn't be had, because, as they said, he had gone to Florida to get away from politicians and the likes-o'-me! that he would be swelled up over his new position and a lot of other becauses. Well, here's exactly what happened. If my wildly imaginative friends read this, they'll have a new vision of the real Mr. Hays as I saw and talked with him at Miami.

"First of all, I want to say that I did not carry a single letter or word of political or other influence with which to unlock the door to Mr. Hays. I forgot politics or friendships and the test was made on purely democratic lines. So far as I know, he had never heard of me, and yet, within twelve minutes from the time he found my note in his hotel box, asking for an interview, he received me as graciously as though I had been a very close and valued friend, while his dinner and an army officer, a guest, I judged, were asked to wait.

"I found him not only charmingly approachable, but liberal to a marked degree as regards the other fellow's view point touching matters in which he might be interested. Then, too, you don't have to crack the varnish in order to get to him, because he possesses that humane polish that reflects 'Good Will Toward Men,'

"He's a good listener, too, as one soon learns, for when one has said his piece, his immediate rise tells you of his grasp of the subject under discussion. If I had been permitted to go deeper into his characteristics I fear I would be classed among, what must be, a very considerable class of his hero worshippers, and I am not sure the fear would frighten me. It did convince me of the wisdom of the big men who picked him to remarry the republican party at the end of its interlocutory divorce.

"I not only talked with Mr. Hays in regard to the Motion Picture Industry, but I talked with men who had talked with him and without exception, all arrived at the same conclusion, viz: That Mr. Hays has a real vision with reference to his work; that the industry's years of plenty shall not be followed by more years of famine if he can prevent them, and the universal guess is, that he can and will if permitted to lead the way. His apparent sincerity and eagerness for the battle, impresses one as a sort of John the Baptist crying in the wilderness of general industry regeneration—prepare ye the way for better and bigger things in the field of his endeavor.

"He voices, and I'm sure feels, that this is a day of right rather than might in the business world, and his firm resolve is to make good those words in his contract that point to the attainment of spiritual, moral and educational standards in the production of motion pictures which will exalt the industry in the realms of art, education and inspirational entertainment, and thereby broaden its sphere, create new value and thus increase returns on investments, which, in the final analysis is a master business stroke, taking the commercial view point, becaue it will command a clientele such as the motion picture interests have never known.

"He's small of stature all right, but the best things come in small packages, you know. I can't think of Mr. Hays in any other way, just now than a diamond set in the greatest circle of golden opportunity for world welfare known to this generation."

Working With Art Director

By Max Parker, Art Director Famous Players-Lasky

One of the most important steps toward making the perfect motion picture is the getting together of the art director and the camerman with the thought of the lighting possibilities constantly in mind, in the planning and designing of each set.

When pictures were in their infancy several years ago the only thing thought of was to have several walls thrown up in a position where they could get the best natural daylight and then the director would shout "Let's go!" And if there was enough light to make an image on the film and actors and flowered wall paper could be seen plainly on the film, everything was fine. The cameraman and the lighting of sets were just a secondary issue.

That has all been changed in the modern pictures and now the aim is to provide adequate means of lighting from a natural source with the sets so broken up in angles and openings that each scene is a work of both architectural and photographic beauty, rivaling the work of the painter's brush.

There should be a close co-operation between the director, art director and the cinematographer in the laying out of the settings for a picture so that after the later is set up on a set we do not hear the time-worn complaint, "How can I light this set and get any beauty out of it?" But instead of that he may say: "Now that's a real set, one that gives me something to work on and there is no reason why it should not be very beautiful."

In other words, he has a chance to use his lights in the most advantageous way and get the desired results. When you stop to think, do you not realize that the lighting can either enhance or destroy all of the beauty of the most carefully designed set? That is why I say the art director and cinematographer should co-operate on all sets.

Another big step is the elimination of the freakish color schemes which used to be in vogue. You would see all the colors of the rainbow in a single set and when it was projected you would lose the vivid colors that the director favored and would naturally get the monotone values, which oftentimes was not a bit pleasing.

What more can a cinematographer ask for than a setting which has been decorated in a color scheme that keys together into a harmonious background of tones pleasing to play against?

I have found that monotone is the best decorative scheme in as much as we can plainly see just what we are going to get on the screen.

I find that the use of color to any great extent is inclined to be tricky and lead to complications that are costly to rectify; therefore I say, let us use tones of gray or sepia and get real pictures,

Endorses Creative Work

The novel single reel picture, "THE ENCHANTED CITY" created by Warren Newcomb has been made the basis of an interesting discussion of an opening up of the possibilities of scenic treatment in motion pictures, in the current issue of Exceptional Photoplays, published by the National Board of Review of Motion Pictures.

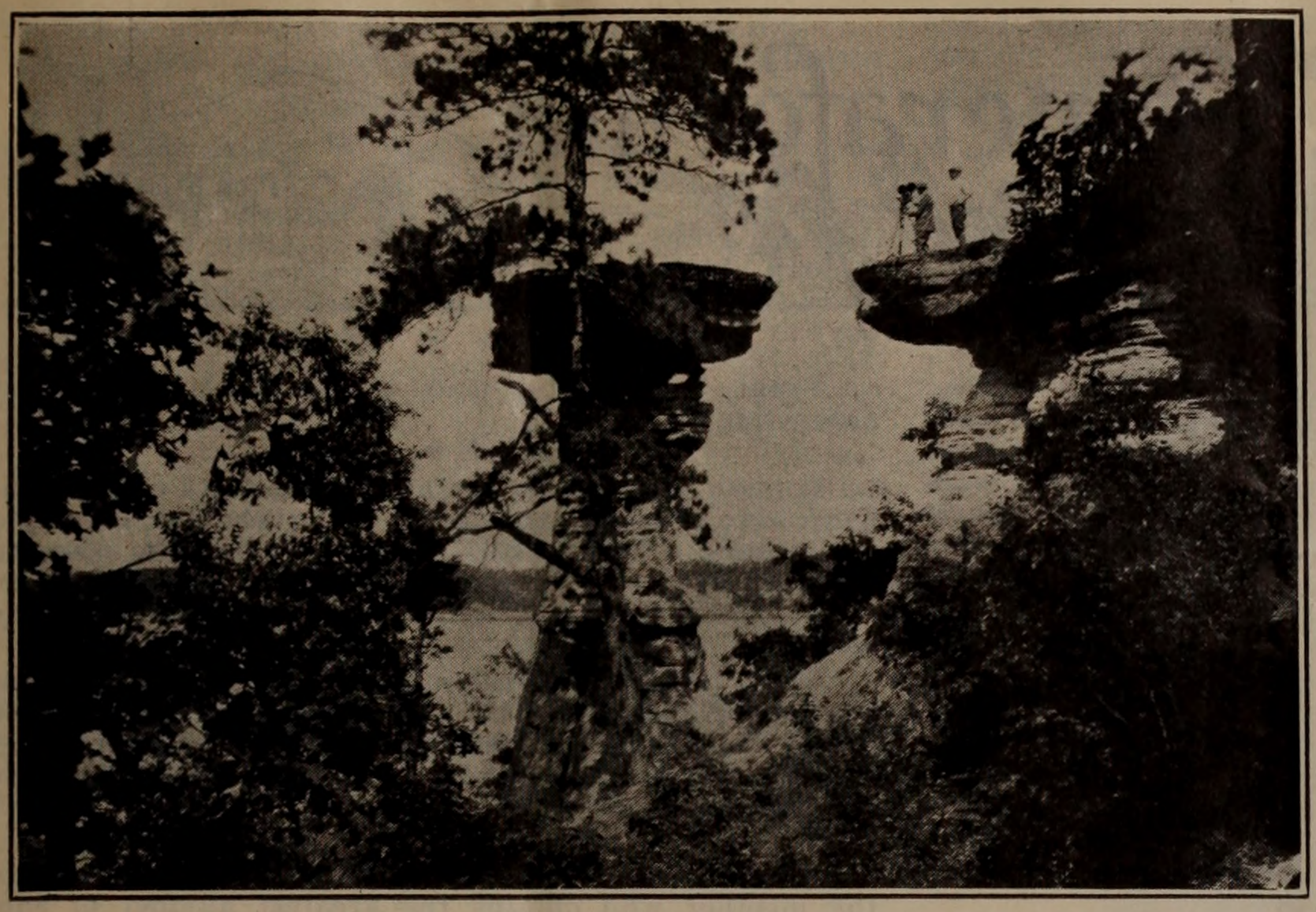
Photography in miniature of printed pictures, and superimposition of photographs of actors upon these flat scenes is at the bottom of this new technique, of which the review says:

"Here, then, is a photographic process which holds out practically unlimited possibilities for the pictorial side of the photodrama. It means that on a surface the size of a small painter's canvass you can execute a scenic background of tremendous proportions—you can put on the screen a picture of the upper spaces of air filled with the constellations, or the entire Inferno, and you can fill it with people appearing in relation to its nearest objects no larger than mere moving specks. It would be impossible to photograph Rossetti's Blessed Damosel leaning from "the gold bar of Heaven" and seeing the earth spin" like a fretful midge". In other words, the artist's imagination is completely unchained to the work in the creative fields of the motion picture screen. Subjects hitherto forbidden by the excessive cost of trying to realize their pictorial and atmospheric backgrounds, are at once made susceptible of treatment and a whole new horizon is opened up to the eye of the cinema camera".

Dealing with the Newcomb picture, the article continues—"One picture, single reel in length, has already been placed before the public, utilizing the photographic technique above outlined. While defective in many ways, at the same time it is tremendously suggestive. . . . . .The pictures of this city, myriad spired and steepled, the mile high palaces above great precipices, the glassy stream by which it rises flowing to a sheer and marble-like descent into the sea, are photographed from small paintings, yet they suggest a dreamed immensity, a character of supernatural architecture and region, which no million dollars expended on built sets could effect except in a meagre and most unconvincing fashion.

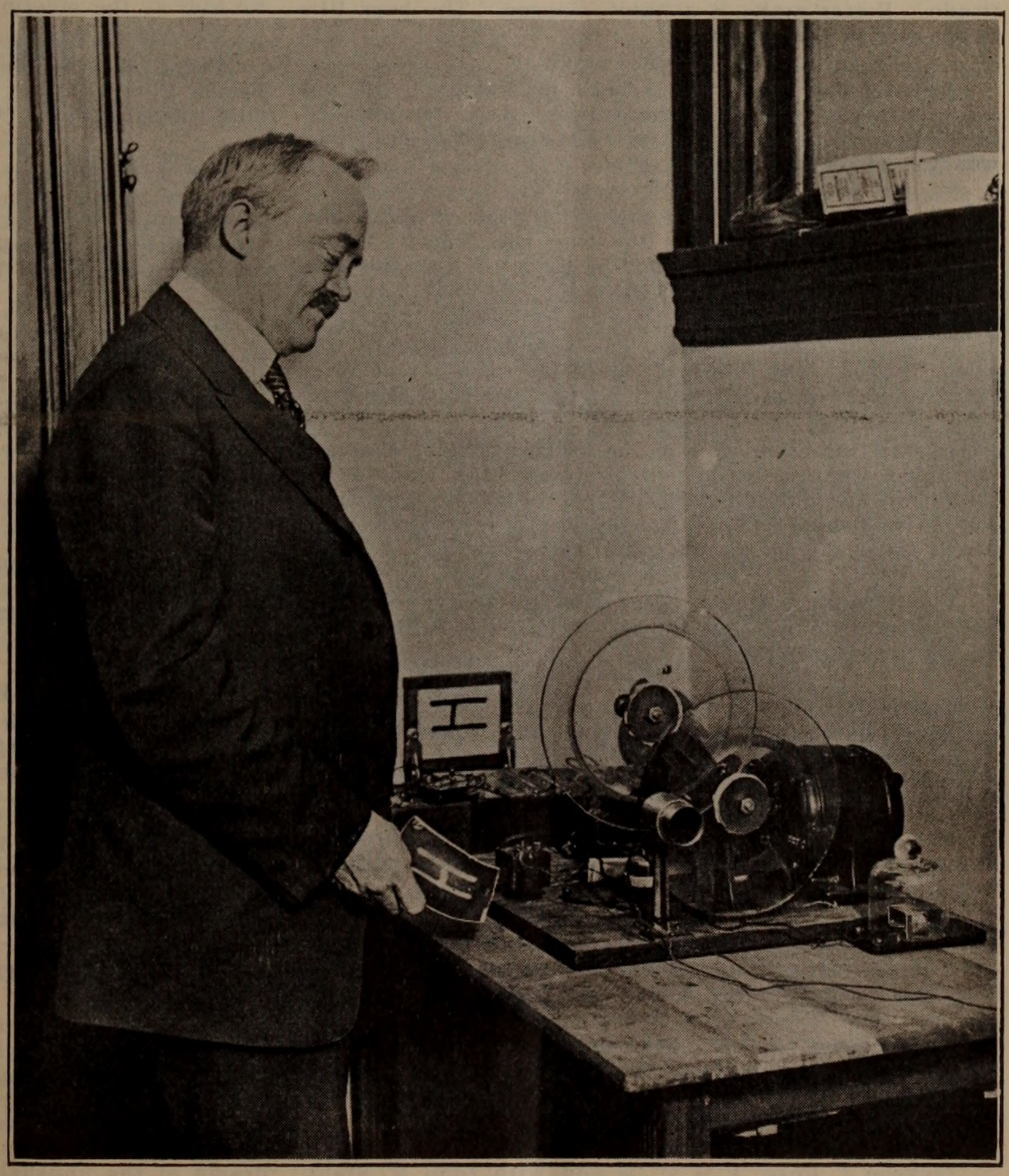
REINSTATED

At the last regular meeting of the Board of Governors, Mr. Andre Barlatier was reinstated to active membership in this Society. His many friends and co-workers wish him a hearty welcome on his return.



Director F. H. Tobey and Cameraman Verne Blakely, of the Rothacker Film Company practical picture division, shooting in the Dells of Wisconsin. The dancing Indians cannot be seen in this still, but the B. & H. way up there on the cliff has them lamped alright. Stand Rock is in the middle foreground.

C. Francis Jenkins with his apparatus by means of which he claims to be able to transmit movies via radio. The movies may be broadcasted from a central station, just as are concerts, etc., and received in the homes of those with receiving sets. Mr. Jenkins has been experimenting for 20 years on various stages of motion picture projection, and only recently conceived the idea of movies by radio.



International Newsreel Photo

Sol Polito, A. S. C., and Norbert Brodin, A. S. C., two progressive knights of the crank, are the newest converts to the Mitchell Camera. Both young men have purchased the finest Mitchell outfits and will use them exclusively in their cinematographic work in the future. The Mitchell is very rapidly winning its way to the hearts of cameramen by sheer service and efficiency. The A. S. C. members who own the Mitchell, and there are now seven of them, cannot too enthusiastically praise it.

Reggie Lyons, A. S. C., has just purchased a new English Napier car. This makes Reggie's thirty-ninth car since he started automobiling fifteen years ago. He has owned more cars than anyone in the motion picture industry and he says he is just getting a fair start.

Georges Rizard, A. S. C., attended the last open meeting and received the glad hand from the assembled multitude. Better make it a habit, George. The boys like to see you in the line up.

Roy Klaffki, A. S. C., is back at Metro on his old job as superintendent of laboratories. Roy was tempted to engage in the radio business, but the call of the "lot" was too strong.

John Arnold, A. S. C., is back on the lot at Metro and who do you suppose he is shooting this time? Right, Viola Dana. Harry Beaumont is directing and the title of the story is "Page Tim O'Brien."

George Meehan, A. S. C., has a Debrie camera for sale. By the way, George has a kid brother at West Point Military Academy. He is Cadet Charles G. Meehan.

Lyman Broening, A. S. C., is assisting Chief Cinematographer Charles Rosher in photographing Mary Pickford's new production of "Tess of the Storm Country." An entire fishing village was built at Chatsworth Lake where the principal action centered.

Victor Milner, A. S. C., arranged the program for the open meeting June 12. He batted in Babe Ruth's class all the way through.

Charles Stumar, A. S. C., has signed up to do the cinematographic work on "Ivanhoe" for Universal. He sailed June 17, for England. The action of the play will take place in England, Scotland and Germany.

President Fred Jackman, A. S. C., is co-directing Louise Fazenda and Teddy in a Sennett comedy with Director Dick Jones.

Phil Whitman, popular secretary of the A. S. C., is too busy to write "Pans and Tilts" any more and that's why there are no more "Pans and Tilts."

Karl Brown, A. S. C., between writing that big article on lenses and holding down his job, is one of the busiest men in the industry. We certainly do miss your "Jimmy the Assistant," Karl.

Jackson J. Rose, A. S. C., is now with John M. Stahl, Mayer Studio, shooting "The Dangerous Age," an All Star picture with Ruth Clifford and Lewis Stone.

Frank B. Good has finished Shirley Mason's latest production for Fox.

Captain Stone and Mr. Dunning of the Prizma Company were guests of the A. S. C. at their club rooms on the evening of June 12th. A reel of color film was run and they spoke at length on the same. Their talk on color photography was enthusiastically received by the members.

After further entertainment Mr. King Baggott was introduced and one of his early films was run followed by an explanation on his part which was thoroughly enjoyed by the members. "Going Straight" was the name of the picture.

Tony Gaudio is contributing a "walking tripod" to the member who obtains the greatest number of subscriptions within the next thirty days, while H. Lyman Broening will give as second prize the "silk hat" worn by him at the meeting of the 26th.

Perry E. Connor, representative of the Eastman Kodak Company, ran a reel of color photography at the club-rooms of the A. S. C. on Monday evening, June 26th.

Mr. J. D. Elms, president and Mr. George A. Minturn, manager of the Widescope Camera & Film Company, were guests of the A. S. C. at the meeting held at the club-rooms on the 26th. A short talk was given by Mr. Minturn on the Widescope Camera.

We are not mentioning any names, but the other day a producer dropped in the office of this Society, looked through the annual issue of the publication in which the biographies and photographs are carried of the various members, picked out a gentleman that looked good to her got in touch with him and engaged him to photograph a production. Yes, he is one of the best looking members we have.

Reginald E. Lyons is photographing "Just Like A Woman" for Haskins Productions at Fine Arts Studio. Frank Beal is directing this all-star-cast, 6-reel, comedy-drama.

EVEN LIGHT

The Cosmosart Studio at 3700 Temple street has equipped their electrical department with Creco lamps. Mr. Chas. Priddy, electrical engineer for Cosmosart recently made a test—from their stock he selected six Crecos at random. These six lamps burned one hour steadily before the first flicker and the arc did not jump once. Mr. Sylvester of the Cinema Sales Co., who manufactures Creco lamps, states that this result is possible with any stock Creco lamp.

SOL POLITO WITH FINIS FOX

Three years ago Sol Polito photographed Metro's big melodrama "Should A Women Tell?" starring Alice Lake. Polito's exquisite photographic artistry made a deep impression upon Finis Fox, author of the story, and the two reached an understanding that has at last been consummated in the production of "The Bishop of The Ozarks." Congressman Howard's dynamic drama of the unusual. Sol now smiles reminiscently behind his new Mitchell camera as Finis gives the magic word, "Camera!"

TESTING AND MAINTAINING PHOTOGRAPHIC QUALITY OF CINEMATOGRAPHIC EMULSIONS

(Continued from page 14)

complete instrument is shown in Fig. 4. A pulley is provided by means of which the wheel can be rotated during the exposure of the film. A small 1/15th H. P. motor geared down to 50 revolutions a minute is used. A box 6x6x33 inches contains the exposing shutter worked by a milled head. The special acetylene burner is fitted on a stand having a horizontal and vertical movement by rack and pinion so that the light itself may be placed at one meter distance from the film surface and exactly centered. The acetylene tank, manometer and lamp house are also shown in the illustration. The film-holder is arranged to take two strips 4¼-inch x 1 inch. The instrument used for impressing a series of known exposures upon positive emulsion is designed so as to give continuous exposures, thus doing away with the intermittency error. A bed plate two meters long is arranged with a series of rollers set in ball bearings over which a slotted plate is pulled, Fig. 5. The steps are cut in the ratio of powers of the square root of two. The sample of positive to be tested is placed in a film-holder directly under the slotted plate. The plate travels the whole length of the bed,

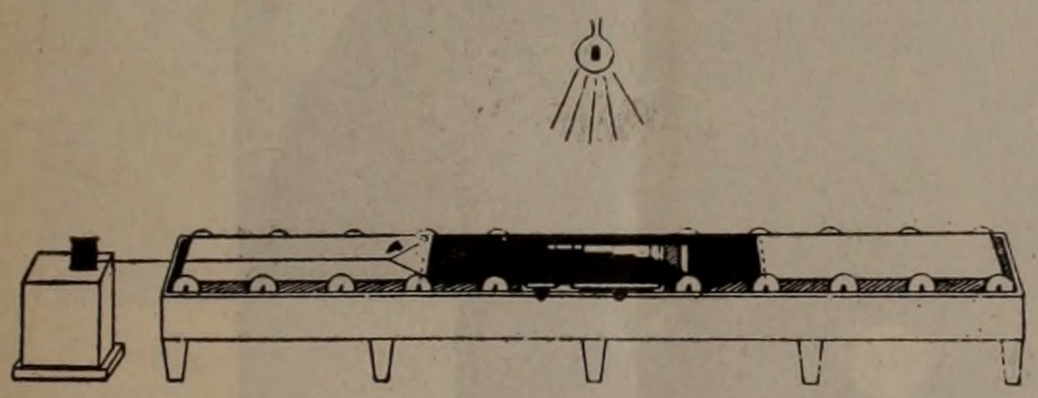


Fig. 5—Arrangement for Continuous Exposure of Film.

and during its passage gives a continuous exposure to the sample strips. The plate is pulled by a very accurate motor and can be set to traverse the entire length of the bed in 10, 20, 40 or 80 seconds. The light source used for this test is an electric lamp which is very accurately controlled by a semi-automatic device. Two ample holders are provided, one to take one strip 1 inch x 7 inches, the other to take six strips 1 inch x 7 inches, so that a number of samples may be tested at one time, if necessary.

Thermostat—A modified form of the Freas water thermostat has been found very satisfactory for controlling the temperature of developing solutions. The complete installation is shown in Fig. 6. The thermostat tank has a capacity of 340 liters of water and is fitted with a paddle stirring device and a mercury regulator which controls the electric heaters through a thermal relay. Hot point tubes are used for heating. There are devices for maintaining the water at constant level and for quickly cooling the water in the tank when the room temperature is too great. A specially designed top is fitted to the instrument with developing cups set down

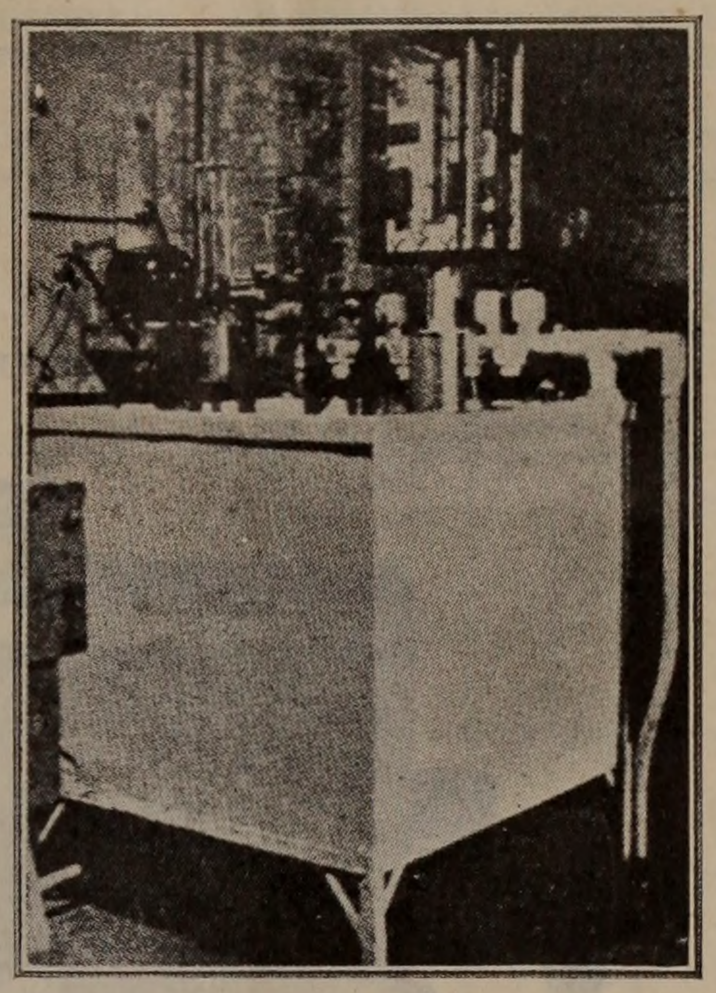


Fig. 6—Water Thermostat used for Controlling of Developing Solutions.

into the water. The film strips to be developed are held in small metal slides which fit around the inner periphery of the cylinder entering the cup. Within an inner cylinder there is a small multiblade paddle which pulls a steady stream of developer from the bottom of the developing cup and discharges it gently over the top of the cylinder, distributing it evenly over the film strips.

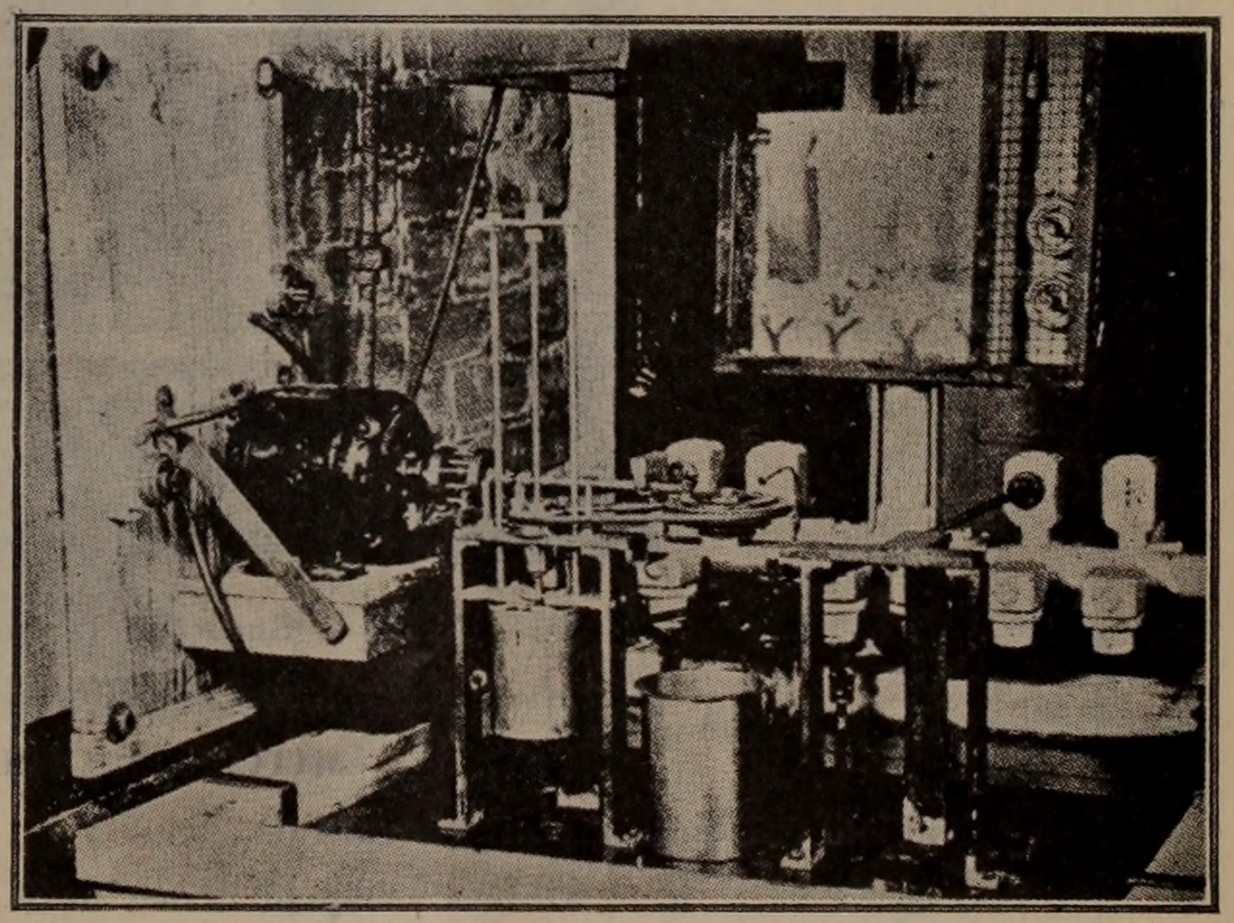


Fig. 7—View of Inside of Water Thermostat.

Fig. 7 shows this part of the instrument in detail. When the various development times are complete the film strips in their holders are withdrawn and placed in the fixing bath without being handled with the fingers. The accuracy of this thermostat is within a 100th of a degree plus or minus, and it will run unattended day in and day out. For accurate results in sensitometry it is of the utmost importance that the temperature of the developer be constant.

Photometers—A photometer as used in photographic work is an instrument for measuring the absorption of light by various media. Polarization or spectro-photometers are usually employed in sensitometric work.

(Continued on page 23)

(Continued from page 21)

The Martens (Fig. 8) polarization photometer is an excellent instrument for the purpose and gives very accurate readings. In this photometer extinction is obtained by means of a Wollaston prism. The formula of converting the readings to densities is log tan *2O1*—log tan *2O1* in which *O1* is the angle or degree of rotation with the negative density in position and O the angle with out the negative density or in other words the zero of the instrument.

Whether we are testing negative or positive film the

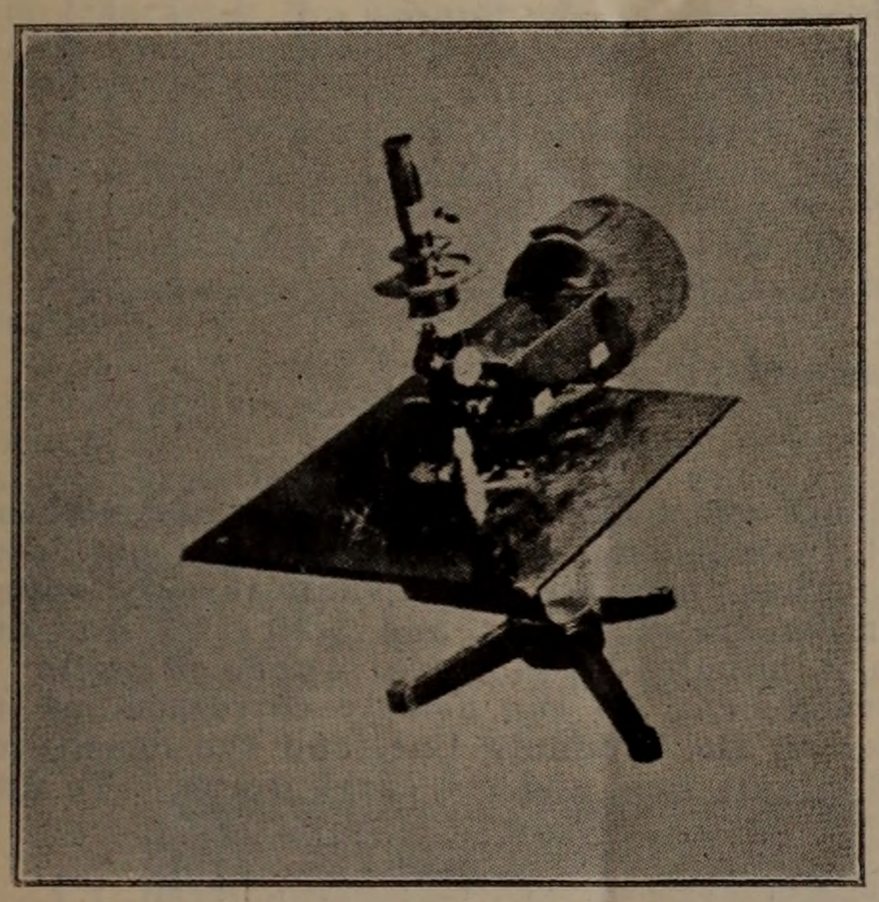


Fig. 8—The Martens Polorization Photometer.

procedure is practically the same, with the exception of the exposing machine and the light source. The film-holder is loaded with two strips of the film to be tested; the strips lie side by side and are exposed together in the exposing machine. After exposure the strips are developed in the thermostat at 65° F. for times t1 and t2 in such ratio that t2 equals 2t1. Almost any developer may be adopted as a standard, but potassium bromide must not be added in emulsion-speed testing. The time of development is a matter of convenience. If too short, the densities are thin; and if too long, the higher densities are hard to read. The time of development does not affect the speed readings obtained. After development the strips are plunged in

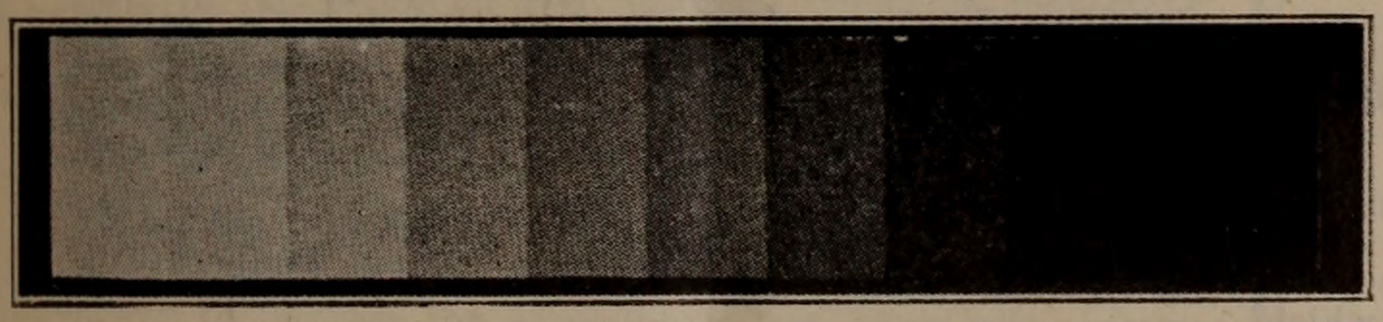


Fig. 9—Test exposed in Sensitometer.

clean hypo and when completely fixed are well washed and immersed in a 5% solution of hydrochloric acid for a few minutes to dissolve any lime salts which may be desposited in the film. The strips are then allowed to dry naturally. The result obtained is shown in Fig. 9. One edge has been left unexposed and is called the "fog strip." From this we can measure the inherent fog in an emulsion viz.: the density of the gelatine, the celluloid and any silver reduced without light action. The series of graduated densities are measured with the photometer, and the results minus fog reading plotted in the form of a curve on a special chart. This curve is known as the characteristic plate curve. The curve is of an S-shape, and if the emulsion has been sufficiently exposed may be divided into three regions, Fig. 10. The concave portion A-B corresponding to underexposure; the straight-line portion B-C corresponding to correct exposure; the convex part C-D denotes the over-exposure period. If we compare this typical curve to a flight of stairs it will be seen that in the underexposure period the steps show a gradually increasing rise. Bearing in mind that each step means growth in density, it will be seen that we have in this period a false relationship. Proportionality exists between exposure and density instead of between exposure and opacity. A negative, the graduations of which fall within this period, will have strong contract and be recognized as underexposed by the practical photographer. In the period of correct exposure the steps are of

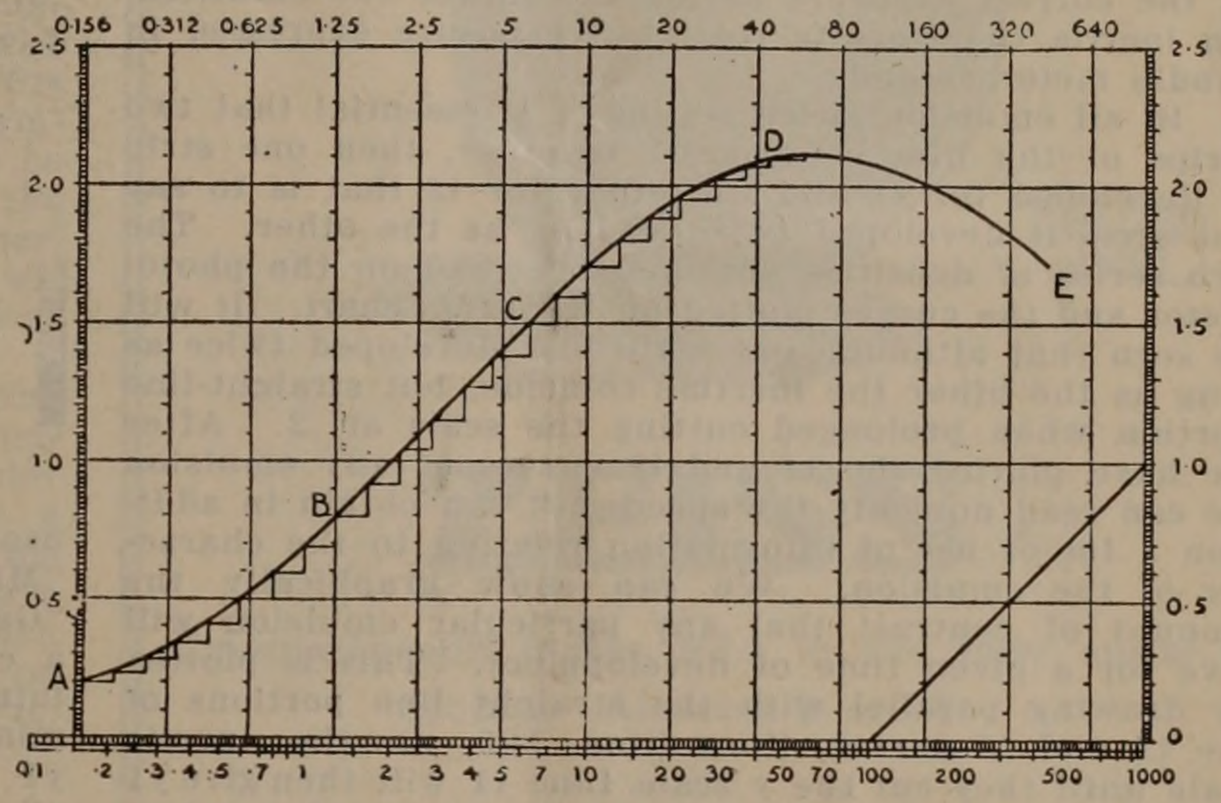


Fig. 10—Characteristic Plate Curve.

equal rise, that is to say each doubling of the exposure is represented by an equal gain in density, and a negative made within the correct exposure period differs as little as possible from that which at the beginning was defined as theoretically perfect. The definition of a perfect negative was that the densities of the negative should be proportionate to the logarithm of the exposures which produced them, and it is characteristic of the straight-line period of the curve that the densities are proportionate to the logarithms of the exposures, hence the longer the straight-line period the better the rendering power and latitude of an emulsion. The over-exposure period is marked by a gradual decrease in rise of the steps which finally become almost imperceptible. In this period the densities, instead of growing with increase of exposure, steadily decrease. A

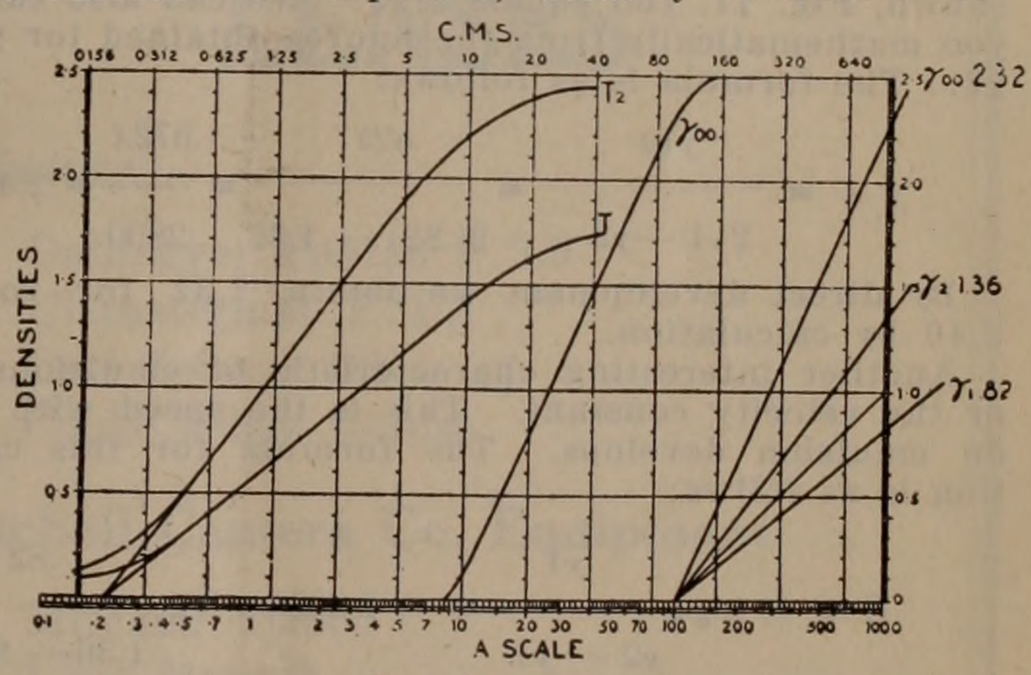


Fig. 11.

negative falling within the overexposure period will also give a false rendering, but in an opposite direction to the underexposure period. Underexposed negatives show too much contrast; overexposure yields a flat, thin negative. The chart on which these curves are plotted is shown in Fig. 11. The top line of figures represent exposures in candle meter seconds. The figures at the left-hand side represent densities. The bottom line is the inertia scale used in determining the emulsion speeds. The righthand set of ordinates are gammas and represent, in a graphic manner, the actual degree of contrast in the negative. The letter Y has been adopted as the symbol for contrast. To obtain the speed of an

emulsion the straight line portion of the curve is prolonged until it cuts the inertia scale, then 34 divided by 1 equals the speed of the plate. This particular constant, 34, holds good only when the light source is equivalent to a standard candle. In the sample shown the inertia is .2 and the speed 170. Inertia is really a measure of the least exposure which will just mark the beginning of the straight-line or correct exposure period. The speed of an emulsion is the inverse value. The longer the exposure required to bring a plate to the beginning of the correct exposure period the slower the emulsion. An inertia therefore is really an exposure expressed in candle meter seconds.

In all emulsion speed testing it is essential that two strips of the film be exposed together, then one strip is developed for t*1* and the other for t*2* that is to say one strip is developed twice as long as the other. The two series of densities obtained are read on the photometer and the curves plotted on the same chart. It will be seen that although one strip was developed twice as long as the other the inertiae coincide, but straight-line portion when prolonged cutting the scale at .2. After we have plotted the t*1* and t*2* curves of any emulsion we can read not only the speed, but can obtain in addition a lot of useful information relating to the character of the emulsion. We can show graphically the amount of contrast that any particular emulsion will give for a given time of development. This is plotted by drawing parallel with the straight line portions of the t*1* and t*2* curves, lines from 100 on the inertia scale until they cut the y scale. Line t1 will then give y1 and t*2* will give y2. Supposing the times of development for t*1* and t*2* to have been three and six minutes, then y1 and y2 represent graphically the degree of contrast and density obtained in three and six minutes development. When the y line of the film coincides with printed y line of the chart the contrasts of the subject photographed are correctly rendered. If the reading is below 1 the contrasts of the subject are reduced, and if above 1 are increased. From y1 and y2 we can determine yoo. This is an important factor. It measures the ultimate contract and density obtainable with a given emulsion. yoo can be determined by direct development. A strip of the film is exposed as usual to a graduated series of light intensities and then developed for 45 minutes, the densities read and the curve plotted. A parallel to the straight-line portion of the curve is drawn from 100 on the inertia scale to the y scale and where it cuts is taken as yoo. In the example shown, Fig. 11, yoo equals 2.32. We can also calculate yoo mathematically from the figures obtained for y1 and y2. The formula is as follows:

$$y\infty = \frac{y1_2}{2y1 - y2} = \frac{.82_2}{2(.82) - 1.36} = \frac{6724}{2800} = 2.40$$

By direct development we obtain 2.32 for yoo and 2.40 by calculation.

Another interesting characteristic of emulsions is K or the velocity constant. This is the speed with which an emulsion develops. The formula for this calculation is as follws:

$$K = \tfrac{1}{3} \log_e \frac{y1}{y2 - y1} = \tfrac{1}{3}\, 2.3026 \times \log_{10} \frac{.82}{1.36 - .82}$$

$$K = \tfrac{1}{3}\, 2.3026 \times \log_{10} 1.52 = \tfrac{1}{3}\, 2.3026 \times .1818 = \tfrac{1}{3}\, .43881 = .1463$$

The factor K depends upon the emulsion, the developer and the temperature of the developer. It increases when concentration of the developer is increased and is usually higher in a slow emulsion than in a fast one, and it decreases as the film ages. For various classes of work it is necessary at times to produce negatives of different contrast. It is a very easy matter to produce a negative of the degree of contrast of y and y is entirely dependent on time of development for a given emulsion. For portrait work a y .80 has been found suitable because softness and modeling are important. For architectural work and interiors generally a y of 1 is suitable, and for landscape or outdoor work a y of 1.30 has been found best. Knowing y1 and y2 for a given emulsion the time of development necessary to reach any chosen y can be shown graphically. The construction is shown in Fig. 12. Here y1 is .82 and y2 1.36. We

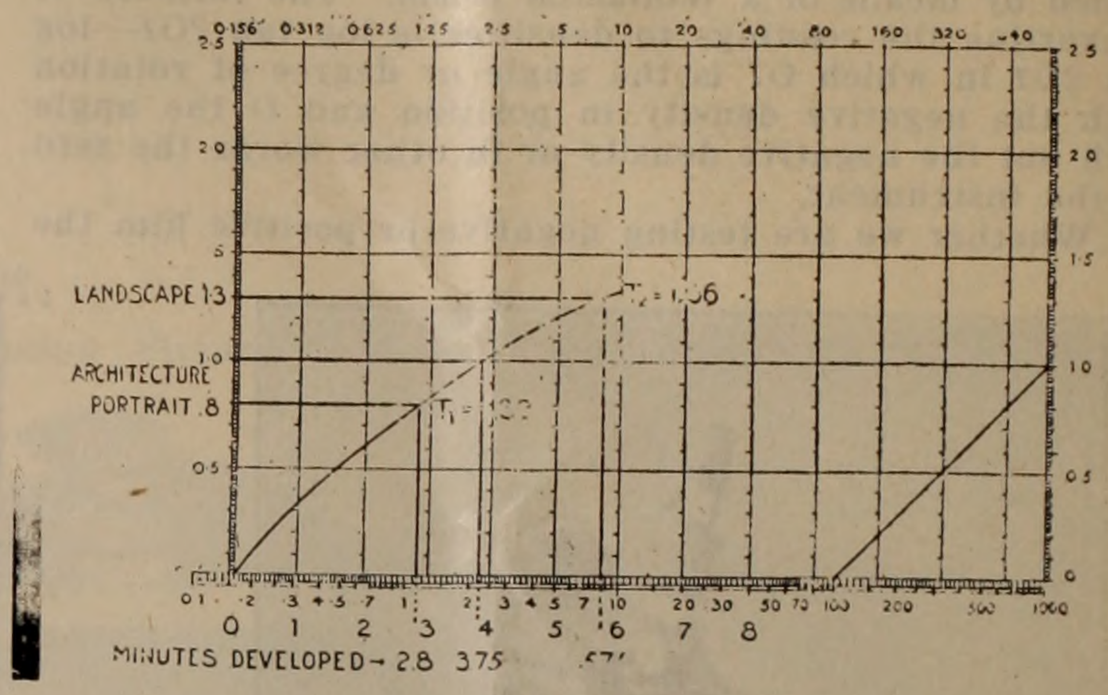


Fig. 12.

use an ordinary chart and make the base line division "Minutes of Development," and the left-hand ordinates "Gammas." Then there are three points through which a curve can be drawn O, .82 and 1.36. y1 was obtained with 3 minutes development, and y2 with 6 minutes development, so the density corresponding to y1 is plotted on the 3-minute line, and the density of y2 on the 6-minute line, and the curve drawn. To find

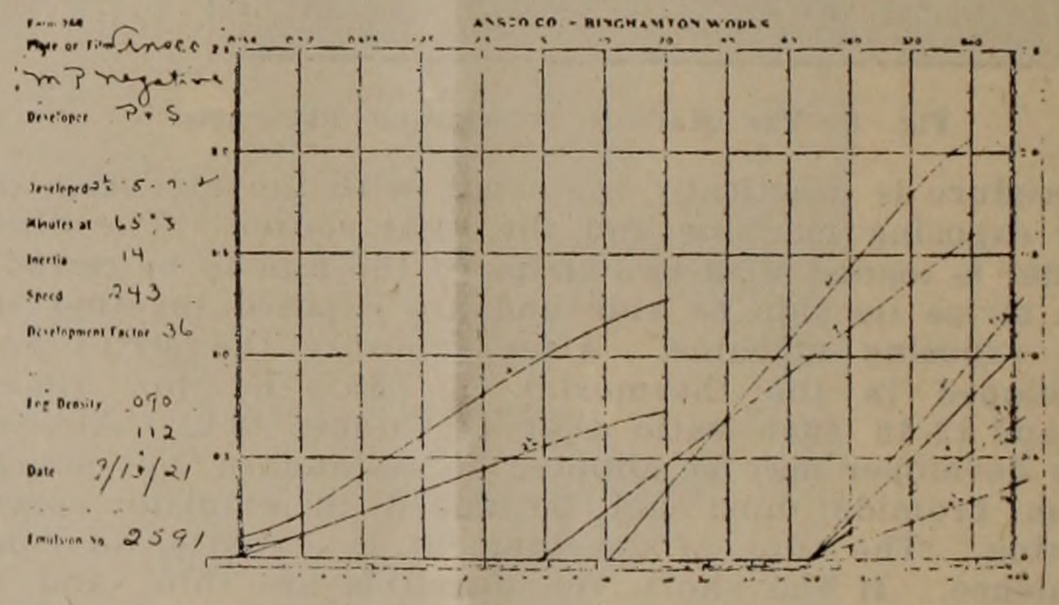


Fig. 13—Typical Factory Chart for Negative Film.

the time of development for gammas of .80, 1 and 1.30, horizontal lines are drawn from these points on the left-hand scale, and where they cut the curve a perpendicular is dropped to the base line. In the example shown a y of .80 is obtained with 2.80 minutes development, y1 in 3.75 minutes and y1.30 in 5.75 minutes development.

When a manufacturer states that his film should be developed for a certain time at a certain temperature,

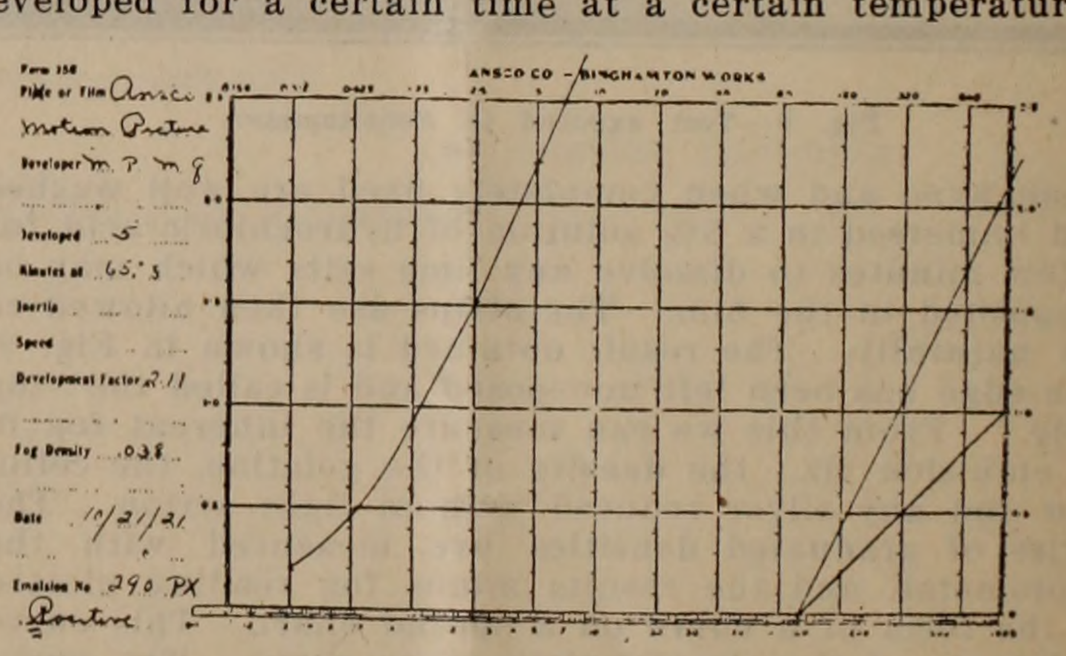


Fig. 14—Typical Factory Chart for Positive Film.

he knows that with the developing formula given a suitable y or contrast will be obtained, that will give the best average rendering of the object photographed.

Figs. 13 and 14 show typical factory charts of negative and positive film. The negative has a speed of 243,

comparatively low contrast, y1 being .36 and y2 being .66 obtained in 2½ and 5 minutes development. y oo is 1.22. The curves show the quality necessary for a negative emulsion, a long scale capable of faithfully rendering a long range of tones and a long straight-line portion indicative of latitude in exposure. The longer the straight line portion the greater the latitude, that is to say greater errors may be made in judging exposure and a good negative still obtained. The positive emulsion shows the degree of contrast necessary for the production of a rich positive of good projection value.

Some other uses for this system of measuring emulsion character are testing of developing solutions, the action of intensifiers or reducers. The various results obtained with different developers, tank solutions, temperature of development or time of development, can be shown graphically, and the instructions issued with the film are arrived at after careful testing in this manner. The photographic value of light sources can be very effectively measured and their relative actinic power plotted.

Apart from the determination of the speed, fog voo and velocity constant of emulsions, there is another important factor which must be tested. This is the color sensitiveness of negative films. To measure this a Hilger Diffraction-Grating Spectagraph is used. This instrument is designed so as to project and bring to a focus in the image plane a diffraction spectrum much in the same way as the image is brought to a focus on an ordinary camera. The instrument is shown in Fig. 15.

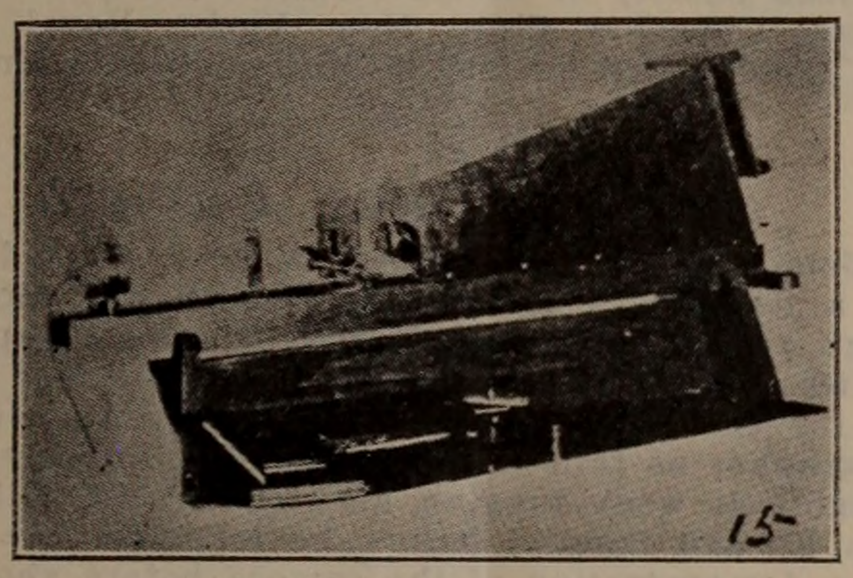


Fig. 15—Hilger Diffraction-Grating Spectrograph.

The film or plateholder is 3¼x4¼ inches and has fitted into it an accurately engraved wave length scale. The film to be tested is exposed behind the wave length scale to the action of the spectrum. The spectroscopic slit has in front of it a black glass wedge that produces a gradient of exposure across the width of the spectrum so that we obtain a negative that shows graphically the color sensitiveness curve of the emulsion. This automatic curve plotting is due to the wedge. If an emulsion is very sensitive to a certain color that color will stand more damping down by the wedge, before its power to impress the emulsion is lost, than will a color to which the plate is not so sensitive, and so the maximum or peak of the curve represents the wave-length to which the emulsion is most sensitive. The results obtained are shown in Fig. 16. The first curve shows a non-color sensitive emulsion. Its maximum is at wave-length 4800 in the blue and it is quite insensitive to yellow. The second curve shows an orthochromatic or color-sensitive emulsion such as is used for negative cinematographic film. A maximum still exists in the blue, but in addition there is a secondary maximum at 5600 in the yellow-green. This additional color-sensitiveness is obtained by adding a dye—erythrosine—to the emulsion during manufacture. The presence of the dye gives to the emulsion the power of absorbing yellow light instead of passing it, and the light so trapped is used in forming a developable image. The spectrograph is also used for determining the absorption and transmission of the various dyes used in dyeing and tinting positive film.

In addition to the purely scientific tests all batches

of emulsion are subjected to a practical factory test which embraces all the usual handling that the films would undergo in the commercial finishing laboratories.

The description of a testing system is rather dry and tiresome, but to the man in the plant it is a living thing—something which indicates in a graphic manner the results of his experiments. From what has been described of the system you will readily understand that the results of any changes in manufacturing methods

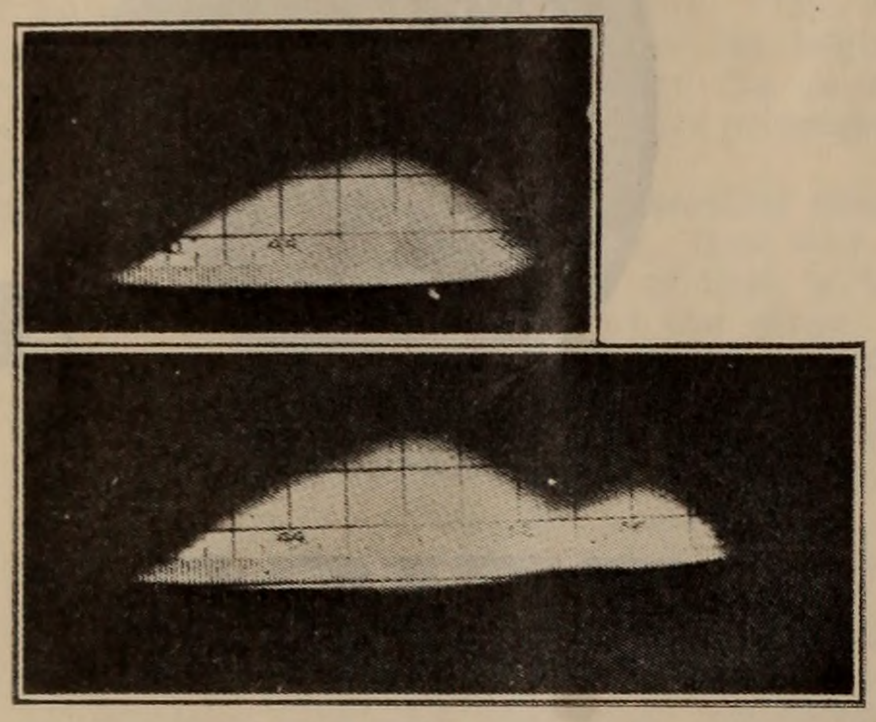


Fig. 16—Spectrograph Curves.

or experiments can be measured and recorded in black and white. What the variation in the readings mean to the emulsion-maker would entail a thorough discussion of the theory and practice of emulsion-making which, of course, is not possible in a paper of this nature, but without the help of scientific system of measuring and recording emulsion quality, it would be exceedingly difficult to produce uniform emulsions day by day and still more difficult to carry on experimental work with a view to improving emulsion quality.

The manufacture of photographic materials is one of the most fascinating and at the same time one of the most difficult branches of applied chemistry and physics. There is no other manufacturing process so beset with difficulties, and yet with all its difficulties the work is of absorbing interest, because there is always something to learn and always some difficulty to overcome. The description given of the system of testing and controlling emulsion quality is just an outline, without dwelling in any way upon its intricate physical and mathematical foundation. Testing the quality of the photographic emulsion is just a small part of the work. Efficient testing and control starts with the nitrating of the raw paper stock for the nitrocellulose dope and ends only when the film is placed in the cans for shipping.

EDITORIAL

(Continued from page 8)

sorry to lose him, it congratulates him upon his prospects of future success and wishes him the good fortune to which he is so fully entitled.

Under the supervision of the editorial board, The American Cinematographer is expected to continue, unabated, the phenomenal growth the magazine has happily experienced in the past few years. That there is a national demand for a bigger and better magazine of this kind there can be no doubt. It is the hope of the men here interested to fill this want to the utmost satisfaction of the film industry.

"Testing and Maintaining Photographic Quality of Cinematographic Emulsions"

MR. ALFRED B. HITCHINS, Ph. D., M. A., director of the Research Laboratory, Ansco Company, Rochester, New York, thinks so well of THE AMERICAN CINEMATOGRAPHER that he has consented to become an associate editor and his name appears on the title page of this issue.

Mr. Hitchins is an international authority on photographic science and for years has been engaged in research work on photographic emulsions. He is an expert on production of celluloid for cinematographic base and is adept in the most up to date practice in studio and laboratory methods. In the chemistry and physics of photography Mr. Hitchins probably has no superior.

He worked out and put into production Ansco Positive Cine Emulsion and Ansco Speeder Camera Roll Film. At present he is directing research on studio technique; laboratory and finishing methods; spectroscopy; sensitometry; color cinematography; microscopic study of photographic image; emulsion chemistry, etc.

A few of Mr. Hitchin's affiliations are: Fellow of the Royal Photographic Society (F. R. P. S.); Royal Microscopic Society (F. R. M. S.); Chemical Society (F. C. S.); Physical Society of London (F. Ph. S. L.); Royal Society of Arts (F. R. S. A.); Linnean Society (F. L. S.); Member of the American Society for Testing Materials; Franklin Institute; Optical Society of America; American Microscopical Society; American Chemical Society; American Society of Bacteriologists; Institute of Graphic Arts; Chemists Club, New York; Royal Societies Club, London and Society of Motion Picture Engineers.

Demonstrates Camera

When Charles Van Enger, A. S. C., started for Europe a few weeks ago he stopped off at Chicago long enough to show the Windy City cinematographers the beauties of his new Mitchell camera. Herford Cowling, A. S. C., who was present, writes to The American Cinematographer as follows: "Charles Van Enger arrived in Chicago last week lugging his trusty Mitchell camera which he had insured before he left Los Angeles, and gave a demonstration of the camera before about thirty of Chicago's best camera boys at the studios of the American Film Company. The Chicago boys were all very much delighted to have the chance to inspect this camera and especially highly pleased with the way Van Enger demonstrated parts that are different from other types. Some exacting tests were proposed by the audience such as triple registration of a title card, rephotographed by triple exposure. All were highly pleased with the results. Afterwards Van Enger gave a theatre party and all present voted him a regular fellow. Van Enger not only made many friends here but has created a good impression for the A. S. C. among the cameramen in Chicago as they all knew him to be an A. S. C. man. A delegation saw him safely on the train to New York.

SHOOTS "SNOW STUFF" IN SUMMER

(Continued from page 6)

Just now we are located at a very well equipped studio in Spokane, doing interiors and location stuff near the city. The weather here is not our sunny south but we are moving right along and hope to show you a real Northwest picture. Notice I say hope, but I know we are getting it in the old box. Well, I must close as I must go out and shoot a howling wolf.

Regards to all the boys.

WORKING AT WARNER'S

E. B. Du Par, A. S. C., has been working with Wallace Worsley at Warner Brothers' Studio on "From Rags to Riches." Wesley Barry and Niles Welsh are playing the leading roles in this production.

Where to Find the Members of the

American Society of Cinematographers

Phone Holly 4404

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Cann, Bert—In Europe.
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Cowling, Herford T.—Making Scenics.
Cronjager, Henry—with Madge Kennedy, New York City.
Davey, Allen M.—
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Depew, Ernest S.—with Al St. John, Fox Sunshine.
Doran, Robert S.—with Charles Parrott, Roach Studio.
Dubray, Joseph A.—with Wm. Seiter, Robertson-Cole Studio.
DuPar, E. B.—with Warner Brothers.
Edeson, Arthur—with Douglas Fairbanks, Fairbanks-Pickford Studio.
Evans, Perry—with Mack Sennett Productions, Sennett Studio.
Fildew, William—with Universal.
Fisher, Ross G.—
Foster, Wm. C.—
Fowler, Harry M.—with Frederick Reel, Robertson-Cole Studio.
Gaudio, Tony G.—with Joseph Schenck Prods-Constance Talmadge, United.
Gilks, A. L.—with Sam Woods, Gloria Swanson, Lasky Studio.
Good, Frank B.—with Fox Studio.
Granville, Fred L.—with British International Corp., London.
Gray, King D.—
Griffin, Walter L.—with Warner Brothers.
Guissart, Rene—with Harley Knoles in charge of photography, London.
Heimerl, Alois G.—
Jackman, Floyd—
Jackman, Fred W.—Supervising Cinematographer, Mack Sennett Studio.
Klaffki, Roy H.—Director of Photography, Metro Studio.
Kline, Ben H.—with Universal.
Koenekamp, Hans F.—with Larry Semon, Vitagraph Studio.
Kull, Edward—
Kurrle, Robert—with Metro Studio.
Lockwood, J. R.—
Lundin, Walter—with Harold Lloyd, Roach Studio.
Lyons, Reginald E.—
MacKenzie, Jack—with Chester Bennett, United Studio.
MacLean, Kenneth G.—with Century Comedies, Century Studio.
Meehan, George—with Chas. Ray, Ray Studio.
Miller, Virgil E.—with Universal.
Milner, Victor—with Universal.
Morgan, Ira H.—with Marion Davies, International, New York.
Newhard, Robert S.—with Nell Shipman Prods., Spokane, Washington.
Norton, Stephen S.—with Mack Sennett Prods., Sennett Studio.
Overbaugh, Roy F.—with Richard Barthlemess, New York City.
Palmer, Ernest S.—In England.
Perry, Paul P.—with Penrhyn Stanlaws, Lasky Studio.
LePicard, Marcel—Co-Director with George Roland, Penn Pictures Co., Phila.
Polito, Sol—with Finis Fox, Cosmopolitan Prods.
Reynolds, Ben F.—with Universal.
Rizard, Georges—with Chas Ray, Ray Studio.
Rose, Jackson—with John Stahl, Mayer Studio.
Rosen, Philip E.—Directing Rudolph Valentinto, Lasky Studio.
Rosher, Charles—with Mary Pickford, Pickford-Fairbanks Studio.
Schoenbaum, Chas. E.—with Irvan Willhart, Lasky Studio.
Schneiderman, George—with Fox Studio.
Scott, Homer A.—with Mack Sennett Productions, Sennett Studio.
Seitz, John F.—with Rex Ingram, Metro Studio.
Siegler, Allen—
Sharp, Henry—with Ince, Ince Studio.
Short, Don—with Fox Studio.
Smith, Steve, Jr.—with Vitagraph Studio.
Stumar, Charles—with Eddie Laemmle, Europe.
Totheroh, Rollie H.—with Charlie Chaplin, Chaplin Studio.
Van Trees, James C.—with Phil Rosen, Rudolph Valentino, Lasky Studio.
Van Enger, Charles—with Maurice Tourneur, Goldwyn, Europe.
Walter, R. W.—with Mack Sennett Prods., Sennett Studio.
Warrenton, Gilbert—with Alice Brady, Lasky in New York.
Whitman, Philip H.—with Universal, Experimental Department.
Wilky, L. Guy—with William Demille, Lasky Studio.
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7510 N. ASHLAND AVENUE
STUDIO AND LABORATORY

NEW YORK
1819 BROADWAY
GOTHAM NATIONAL BANK BLDG.

Paramount-Burton Holmes Travel Pictures

EDITED AND TITLED BY
BURTON HOLMES

PHOTOGRAPHED BY
HERFORD TYNES COWLING

PRODUCED BY
Burton Holmes Lectures, Inc.

7522 North Ashland Ave
Chicago, Ill.
April 21 - 1922.

Mitchell Camera Company,
Los Angeles, California.

Sirs:

In response to your several telegrams, I arranged for Mr. Chas Van Enger to demonstrate the Mitchell Camera at the American Film Company stodios.

We were all most favorably impressed with Mr. Van Enger's ability to demonstrate the machine as well as the perfection of your camera. The concensus of opinion among the ~~several~~ thirty odd cameramen who were present was that you were to be congratulated upon the development of such a fine piece of photographic mechanism. Everyone was highly pleased. Mr. Van Enger made some very exacting tests such as double exposures for registration which were developed at once: The results were highly satisfactory. A title card was re-photographed several times to assure perfection of registration in one of the tests.

It appears possible that I may come to Los Angeles within the next few weeks - at which time I hope to have the pleasure of seeing your producing factory and observing the Mitchell in it's making.

Very cordially yours,

H. T. Cowling

H. T. Cowling